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GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

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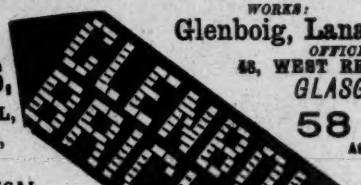

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VOL. CLXVII., No. 3198.] WEDNESDAY, AUGUST 27, 1924. [76TH YEAR.

EDITORIAL NOTES.

Eradicating Trouble—Geyser Design and Installation.

A VALUABLE piece of work has been accomplished by the Gas Appliances Sub-Committee of the National Gas Council in the issue of a specification for the construction and fixing of gas-geysers. The report of the Sub-Committee (of which Mr. R. J. Rogers was Chairman, and Mr. Harry Clark and Mr. E. C. Holt, Joint Secretaries), read in conjunction with the specification, supplies manufacturers of such appliances with a good standard to which to work. It is an excellent thing that there should be collaboration in these matters, because work such as that we have before us gives the makers a comprehensive idea of what the gas supply industry regards as necessary standard practice, below which, in any particular, gas undertakings will not wish to purchase. We have obtained permission to publish the report and specification in our columns; and it will be agreed that it has been issued at a very appropriate time. Those readers who study the current tendency of affairs will have observed two possible directions in which legislative influence may be brought to bear upon the development in use of domestic gas appliances; and geysers will take a very important part and place in what it is expected will be done. It will have been noticed that an amendment has been made in the Smoke Abatement Bill, which (when it reaches the Statute Book) will give local authorities power to make by-laws in respect of new premises—including dwelling-houses—which will require such arrangements to be made for heating and cooking as are calculated to prevent or reduce the emission of smoke. Wherever that power is applied, we can see the doom in new dwellings of the old-fashioned coal-heated cooking range and water-heating boiler; and then in houses where a gas-heated circulating boiler would not be fixed, the geyser will have considerable adoption. Associated with this is Mr. W. J. A. Butterfield's report to the Board of Trade on "Carbon Monoxide in Public Gas Supplies." In this, in connection with the recommendation as to the periodical inspection of gas piping, fittings, and appliances, it is proposed that the makers should collaborate in the elimination of unsound and unsafe appliances—including flueless heaters and geysers without proper and adequate vent to the open air. The reputable makers of geysers wish, as much as the gas industry, to ensure safety in application, as it does their business no good to have appliances fitted in manner which produces inefficiency, and is a menace to the user in (say) a bathroom, while proper vent makes a geyser as safe, and certainly more economical and efficient, than any other means of water heating. The Smoke Abatement Bill and Mr. Butterfield's report together mean geyser expansion, and an assurance of safety in use.

Gas geysers are increasing in popularity day by day; the specification and recommendations of the Gas Appliances Specification Sub-Committee are designed to enhance that popularity. The thermal efficiency of these appliances is high. Hence they are economical in use; and their service is rendered promptly. Against the gas-geyser, the water-heating introductions of the electricity supply industry are grotesque in respect of economy and time and working efficiency. The principal point the Committee have had to attack—recognizing the progress the makers have made in design and efficiency—has been the provision of safeguards against accidents; and we think the manufacturers will appreciate collaboration which will cause their appliances to be still more desirable. The classes of accidents the Committee have had particularly in view are those arising from misuse and improper fixing; and so they set themselves the task of trying to do what is possible to ensure that all geysers are made foolproof, and that the days of wrong fixing and unventilated geysers are left behind. It is in the improvement of details in this and other directions that the service efficiency of the industry as a whole will be raised; and this will be a distinct gain in the promotion of gas trading and its stability. Geysers supply only part of the work that has to be done in this direction on the appliance side; and on the other side the efficiencies of administrative policy and of men are other phases of the work that are being attacked. It is all to the good.

In view of the likelihood of a scheme of inspection of piping, fittings, and appliances being introduced into the gas industry, the present report comes opportunely. To the Sub-Committee there appears to be considerable evidence of lack of supervision of the persons who fix water-heating apparatus, or of co-operation between them and the gas undertakings. To secure reliable and satisfactory results, in the interests alike of consumers and gas suppliers, a number of recommendations are submitted to which there should be strict adherence. The Sub-Committee have a preference for geysers being fitted with automatic dual gas and water valves, so that the gas to the burner will be automatically reduced to the by-pass jets in the event of the failure of the water supply for any reason. There is no opposition to interlocking taps (which are common practice) when strongly made and properly designed; but we have come across instances where these do not permanently keep their mutual relationship. A case came under observation recently where the water-tap worked loose, and was tightened and supposed to be adjusted by a local fitter. But the tightening affected the interaction of the gas and water taps; and it was then possible to light the geyser burner without turning on the water. Twice that geyser came to grief—the second time permanently, and fortunately without any other damage. The preference of the Sub-Committee for an automatic dual valve is stated decisively. Cast-iron swing-out burners are also specified, with provision for retarding the full flow of gas until the burner is in proper position in the geyser. As to capacities, five sizes are named—1, 1½, 2, 3, and 4 gallons per minute, and numbered to correspond. Naturally, geysers should be designed to give the highest possible temperature in the time stated with the lowest possible gas consumption. We are pleased to see the recommendation of the Sub-Committee that a minimum temperature rise of 60° Fahr. at the specified rates of flow should be guaranteed with a definite consumption of B.Th.U. Some of our manufacturers do not appear to have grasped the importance of quoting consumptions for a given duty in B.Th.U. Cubic feet is still the common expression; but there is no meaning attached to "cubic feet" in these days of sales by the therm and tests of performance on the thermal basis. Then it is the opinion of the Sub-Committee that geysers should give a minimum thermal efficiency of 80 p.ct. It would perhaps be well to add (though it will be generally understood) "on the gross calorific value of the gas." There are some miscellaneous recommendations. A most important one in the interests of safety is that dealing with ventilation, which should be arranged so that there can be no interference with it, and it will remain permanent. Instructions are also given regarding vent-pipes. Another feature which is properly emphasized is that dissatisfaction has often been caused by geysers being fixed to a house gas pipe system which is inadequate. It cannot be believed that any responsible officer

of a gas undertaking would allow such a condition to pass; but it is a defect in numerous cases where the work is carried out by an outside fitter whose profit and interest end with the completion of installation. It is a good thing, wherever possible, to run a supply-pipe to the geyser direct from the meter outlet.

The report and the specification will be valuable to the industry. This, we are sure, will be agreed by those who have not yet perused them, but have now the opportunity of doing so through the reproduction in later columns of the "JOURNAL" this week. When ready for publication, the instruction book, giving full particulars and sketches of how geysers should be fixed, will also be very serviceable; and we hope, in the interests of every gas undertaking, the circulation of it will be freely made among all concerned in the installation of geysers.

Special Order Procedure.

SEVERAL references have been made in the "JOURNAL" to proposals to interfere with, and to make more complex and expensive, the procedure whereby statutory powers are obtained under Special Orders. It is strange that such suggestions should be made; and it would be highly interesting to know exactly the reason for them. The Gas Regulation Act was passed by Parliament; and the system then set-up gave satisfaction. It is only four years since the Act received Royal Assent; and the measures which now govern the doings of the electricity industry in respect of new statutory authority have been passed within the last five years. Then what are the objects of already trying to create diversions in procedure? It is said that Parliament has not now sufficient control over the granting of new powers. Parliament has all the confirmatory power that is necessary. It cannot be contended that the Special Order procedure has not worked beneficially from the legislative and public points of view. It has; and what is more, although the course of securing additional powers is easier, and more economical in time, money, and so forth, all concerned—Parliament included—have greater protection in that the measures are submitted to the examination of those who are expert in these affairs, in view of the fact that their whole working time is devoted to such investigation and adjudication. What is more, there is a continuity in the (so to speak) tribunal to which investigation of the Orders is submitted. The experience so gained stands for much; and it gives an assurance which it is difficult to feel when measures are committed to the decision (we say this without any disrespect) of a Committee of Parliament mostly devoid of technical qualification and without continuous experience in the work. The present procedure is, in securing correct decisions, a decided advance upon the old order of things; and yet it is more expeditious and certainly less wasteful. Wherefore then the desire to be reactionary by interfering with what is so meritorious, and to revert largely to a practice which has far less to commend it? We cannot help thinking that there are in this matter some subterranean influences at work, stirred into action not by consideration as to what is the best course of procedure, not by a desire to secure additional control by Parliament, but by that most potent of stimulants—self-interest. If this be so, Parliament ought not to allow self-interest to ride above public and industrial advantage, and a proved advance upon former procedure.

As before mentioned, proposals to modify the procedure with regard to Special Orders have been before the House of Lords, who appointed a Select Committee to consider the matter. This Committee were approached by the National Gas Council to ascertain whether they would take oral evidence. There was refusal, but a courteous intimation of willingness to consider a memorandum on the subject. One has been prepared and submitted on behalf of the Council, who represent some 90 p.ct. of the gas produced in the United Kingdom. A very good case it is; and its arguments, we hope, will be successful in preserving the present Special Order procedure. The history of parliamentary methods to obtain additional powers is traced up to the passing of the Gas Regulation Act. It is inferred that in this it was the intention of the Legislature, in authorizing Special Order procedure, to cheapen and expedite the system of obtaining statutory powers relating to technical questions affecting the gas industry, as an inducement to non-statutory companies to bring themselves within the controlling provisions of the Act, and also to enable small statutory concerns to reconstruct their authorization up to date. To other gas undertakings it has also been beneficial. Orders can be applied for at any time. Expedition and the saving of costs and parliamentary time are promoted; while the procedure gives full opportunities for the consideration of the interests of gas consumers as represented by local authorities, and of all other parties affected by the Order.

Experience of the working since the Act was passed should weigh heavily in the consideration of any change in procedure. Any alteration which will detract from the acknowledged benefits, we hope will not be commended by the Select Committee. The National Gas Council believe—and they have good ground for the belief—that the procedure and the way the Act has been administered have caused general satisfaction to both gas suppliers and local authorities. A large number of Special Orders have been made under the new procedure; the Director of Gas Administration (Mr. H. C. Honey) last June gave the number of Special Orders issued as 124 (apart from the 549 Orders made under section 1). Through the Special Orders many undertakings have obtained powers of great advantage to their consumers, for which, on grounds of expense, they would have hesitated to apply by Provisional Order or by Private Bill. No less than 37 of the Orders have been obtained by very small undertakings; the make of gas in some cases having been as low as 4 or 5 million c.ft. per annum. Application for parliamentary powers has been so long associated with heavy expense that there is no doubt the fear still exists that even to obtain powers by Special Orders may involve a large outlay. This is a deterrent to application. The fear, however, is being gradually dissipated; and a new and healthy start has been made in getting more small concerns to apply for statutory status. It is hoped that the Select Committee will hesitate to recommend any changes which will remove the inducements provided by the existing Special Order procedure, by which all interests are adequately safeguarded.

An Appeal to Chief Executive Officers.

THE gas sales or public service department has been gradually ascending to the higher, and merited, place in the composite work of a gas undertaking to which the importance of its operations assigns it. Time was when there was a large amount of indifference regarding this section of the business. Organization, system, and attitude were (may it not be said?) in the majority of cases not what they should have been. Those things have been changed; but the change has been carried further along the correct road in some cases than in others. What is wanted is that the highest standards of public service and sales methods should obtain in every gas undertaking according to its position. One result of the alteration is an accruing ability of the men engaged upon the work. This is improving their status; and, through the more effective service which naturally follows, the gas business is being given more stability and greater scope for development. There is, in short, a marked movement for higher efficiency in the public service and sales department; and higher efficiency, even in this one department, is composed of several parts. But the chief part is the men.

Therefore, we make no apology or excuse for claiming that these members of the staff should be given, by the administrators of gas undertakings, every facility for gaining knowledge and new ideas. This is being done by many undertakings which make it possible, by allowing time and expenses, for the public service and sales staffs to attend the meetings of the Salesmen's Circles, and by distributing among them month by month copies of "THE GAS SALESMAN." An unusual opportunity for helping forward this movement, and for showing the expanding strength of the gas industry in the sales and service part of their undertakings, will be afforded by the second annual conference of gas salesmen, which is to be held at the British Empire Exhibition on Wednesday, Oct. 15. It is desired by the "B.C.G.A." that the joint meeting on this occasion shall be, as far as it can be made so, a "mass" one, and without limitation to members of the Circles. It is hoped on that day there will be a massing at Wembley of gas salesmen from all quarters of these isles; and the term "salesmen" is to be construed as connoting all members of staffs of gas undertakings who come in contact with the public. There is a good programme for the morning conference; and there is the Gas Exhibit for the afternoon. Time may be found for

examining the best our electrical rivals in business have to show; and salesmen will be interested to see how other industries make public demonstration. The visit will be educative all the time. At the morning conference, there will be education and stimulation in addresses, papers, and discussions; and there is throughout the exhibition a profusion and diversity of object-lessons for the salesman which will both delight and instruct.

The appeal to the chief executive officers is to make recommendation and to use their influence to secure facilities for as many as is convenient of the members of their public service and sales staffs to be at Wembley on Oct. 15. In "THE GAS SALESMAN" distributed with this issue will be found an account of the arrangements for the day; and it will be remarked that special provision has been made for travelling, &c. In order to simplify the work of organizing the meeting, and to avoid confusion and duplication, it is proposed that the applications for railway vouchers and other tickets shall be made by each undertaking for the members of the staffs who will be attending. This conference should be made a big demonstration of the man-power engaged by the gas industry to develop and meet the requirements of the public in the matter of light, heat, and power. A verbatim report of the conference, and a general descriptive article upon the event, will appear in "THE GAS SALESMAN," which will be issued on Oct. 22—for that month and that occasion only, a week earlier than usual.

To Help the Mint.

Gas undertakings are asked to co-operate with the Mint authorities in withdrawing from circulation the "uncrowned" copper coins—those with the head of Queen Victoria without a crown. This is only part of the systematic withdrawal from circulation of worn copper coins. It is believed that a large number find their way into slot meters. The wanted coins represent the Victorian issues of bronze coinage between 1860 and 1894. During the 34 years, it is stated, the total value of bronze pennies issued was £1,493,490—representing practically 358½ million coins. Only a very small percentage of the uncrowned pennies have as yet been returned to the Mint.

Northern Ireland Gas Examination Candidates.

In our "Correspondence" columns, Mr. Walter T. Dunn informs readers that the Government of Northern Ireland have approved of the Education Scheme of the Institution of Gas Engineers. Candidates who desire to sit for the examinations in 1925 should read Mr. Dunn's letter, and at once comply with the instructions.

Street Lamp Painting.

What is a fair cost for painting a street lamp? The Urban District Council of Coalville (which those who know their geography well will be aware is situated in Leicestershire) have declined to accept a tender to paint 400 street lamps for £32 17s. 6d., which works out to 1s. 7·2d. per lamp. The ground of their refusal is that the work cannot be well done for the money. They have therefore accepted a tender for 3s. 9d. per lamp, which is more than double the lowest tender. In view of this the Council have been subject to newspaper strictures; and labour is accused of wasting money. Whether or not it is waste will depend on the quality of the paint, and the finish given to the lamps. Economy is not always found in cheapness.

A Mouthpiece of the Old Visionaries.

The Minister of Transport (Mr. Harry Gosling), when taking part in the inauguration of the work on the new arterial road between Edinburgh and Glasgow, took the opportunity of saying something about the Government plans for assisting the electricity supply industry. According to him, they are going to introduce legislation for the purpose in the autumn, and then electricity generation will come more into public hands. It was not really Mr. Gosling who was speaking; he was merely the mouthpiece of the old visionaries in this direction. He gave utterance to the same things that were said years ago. It is hoped by concentration, by a standard of frequency, by laying great transmission mains, and by co-operation, to cheapen electricity to such an extent that it could be used even in rural areas. The capital cost does not appear to be taken into the "cheapening" calculation. Added Mr. Gosling: "I am one of those who believe electricity should be in every working-class home. A woman should have it doing her washing, ironing, and house cleaning. That cannot be possible until it is very much cheaper; and the Government are trying to do what they can in that direction—to some extent applying public funds to give it a start." Whether the plans will cheapen the cost of production, is a moot point. But there is much more to be done than the cheapening of the energy before electricity can be economically applied to the purposes Mr. Gosling has in view. And upon those matters expert brains have been at work before Mr. Gosling troubled himself much about them; and the impression they have made is not great. Perhaps a Labour Government will be able to work miracles where other people have failed.

Harnessing the Tides.

Reference was made in last week's "JOURNAL" to a project for the erection of a hydro power plant at West Mersea, Essex, to be operated by utilizing the rise and fall of the tides. It was stated that the site had been selected on account of its natural facilities, and because the neighbouring towns, including Colchester and Southend, will ensure a large demand for the electricity generated. The idea of harnessing the tides for this purpose is growing quite ancient; but the materialization is not commensurate with the time devoted to its consideration and discussion. It is one of those things that may appeal to the popular imagination; but practical technical men, on looking into the details, have never been enamoured of the practicability. So far as we know, a start has not yet been made with the plant at West Mersea. Probably the announcements in the papers are first efforts at interesting the public before making an application for capital. Anyway, whatever the purpose, there is nothing tangible to show that it will be a success technically or financially. It is noticed that neighbouring towns, including Colchester and Southend, will "ensure" a large demand for the electricity generated. Is this a certainty? It is a point that requires looking into. There is no evidence that Colchester and Southend are so struck by the proposal that they are prepared to throw over their own generating stations and the improvement in their running by the increase of business and load, and to take energy developed by the tides at West Mersea. As a matter of fact, we believe that Colchester has considered the scheme; but the Corporation prefer to put down additional plant of their own. A scheme for doing this has been endorsed by the Electricity Commissioners; so that Colchester is not likely to participate in ensuring a large demand for the electricity generated at West Mersea—assuming that the project is carried further.

Coal Exports.

In July there was, compared with June, a noticeable improvement in the tonnage of coals shipped abroad, but the average value was somewhat lower. The total quantity of all kinds exported was 5 487,889 tons, as against 6,767,255 tons in July, 1923, and 5,063,763 tons in July, 1922—the values being respectively £6,636,621, £8,841,301, and £5.579,538. The amount of gas coal exported was 785.598 tons, the value of which was £870,995, or an average of £1 2s. 2d. per ton. The quantity shipped in July, 1923, was 796,762 tons, and in July, 1922, 725,897 tons; the respective values being £999,291 and £771,107. In the seven months of the year, 36,618,946 tons of coal of all sorts were exported, as compared with 46,576,136 tons in July, 1923, and 32,247,723 tons in July, 1922. The values for the three years were: 1924, £44,366,613; 1923, £59,256,731; and 1922, £36,427,301. The gas coal exported in the seven months of this year amounted to 4,997 530 tons, as contrasted with 5,444,976 tons in the corresponding period of 1923, and 4,574,677 tons in the same months of 1922. The respective values were £5.903.565, £6,628,796, and £5,038.800.

Gas Coke Shipments.

As in the case of coal, there was a slight improvement in the quantity of gas coke exported during July, as compared with the preceding month. The quantity was 65,102 tons, and the value received was £110,724, which shows an average of £1 14s. 0·18d. per ton. A much larger business was done in July, 1923, when 82,806 tons were exported. But in July, 1922, the quantity sent abroad was only 54,516 tons. The value in July, 1923, was

£140,305, and in July, 1922, £74,629. In the seven months, 507,819 tons were shipped; the value being £887,459. The figures for the corresponding periods of 1923 and 1922 were respectively 589,574 tons and 382,041 tons. The value for 1923 was £904,525 and for 1922 £563,157.

Sulphate of Ammonia Exports.

The amount of sulphate of ammonia exported in July, 1924, was 20,047 tons, which is very close to the figure for the same month of 1923—20,586 tons. During the seven months of this year, 154,596 tons were sold for use abroad, as compared with 144,146 tons last year. Therefore this year's foreign business shows so far an expansion of 10,450 tons. Spain and the Canaries were the chief buyers last month, with 12,087 tons.

Liquid Products Exported.

The quantity of benzole sent out of the country seems to be on the increase. In July, 266,626 gallons of benzole were shipped, which compares with 67,763 gallons in July, 1923. The total quantity of benzole sent abroad in the past seven months was no less than 1,093,260 gallons, which compares with 632,376 gallons in the seven months of 1923. Last month 4699 gallons of naphtha found markets abroad, as against 9281 gallons in 1923. The quantity shipped in the seven months was 149,510 gallons, which compares with 75,004 gallons in the corresponding period of 1923. With regard to tar oil, creosote, &c., the exports in July reached 5,255,444 gallons, which compares with 2,029,275 gallons in July, 1923. In the seven months of this year, the total was 24,024,640 gallons, as against 28,233,554 gallons in the same period of 1923.

Oil and Fish.

Last week [p. 633] comment was made on a letter by Mr. Alderman J. W. Willis-Bund, Chairman of the Worcestershire County Council, and Chairman of the Severn Fishery Board, in which he expressed the opinion that the complaints as to fish being poisoned are due not to the tar-dressing of roads, but to the oil, &c., which leaks from motors and finds its way into the rivers. Now holiday makers and yachtsmen at many places round the coast are complaining of the pollution of the sea by oil; and mention is also made as to the injuries done to the fisheries. It is thought that all this is due to the displacing of coal by oil on board ship. We would suggest that a contributory source of the pollution is the discharge of surface washings from roads into the sea—road washings containing the refuse oil from motor cars. We see a good deal of this filth on the surfaces of roads at the present time.

Wembley Suffers from a Storm.

During a heavy thunderstorm last Friday afternoon, a large area of the Palace of Engineering was flooded—here and there to a depth of 2 or 3 in. Fortunately, the exhibition stands are raised from the floor; but although no very great damage was done, the visitors were considerably inconvenienced. In certain parts of the hall the floor boards had to be taken up. The rain also penetrated into the Palace of Industry; and in the musical section the avenues were inches deep in water.

Building Trade Settlement.

There has been a settlement of this dispute; the Covent Garden strike is approaching exhaustion; and the electrical strike appears to be on the high road to settlement. The end of the building strike is important; and now it may be hoped that all parties concerned will settle down to the work of giving the nation the additional houses that are required. The terms of settlement are that the wages of all craftsmen and labourers are to be immediately increased by ½d. per hour, with the exception that workers in those towns which have received 1d. and upwards since Sept. 26, 1923, will receive the ½d. advance as and from Oct. 1 next. There is to be stabilization until Feb. 1, 1926. The summer working hours—other than in those localities that have agreed to vary them by mutual consent—are to be 46½ per week, as and from the commencement of official summer time, 1925. The men had previously stood firm for a 44-hour week. The Liverpool operatives have resolved that the local agreement shall be binding until Dec. 1, 1925, after which date all national rules and conditions (other than wages) are to be operative in Liverpool.

PERSONAL.

The marriage took place at Bispham Parish Church, last week, of Miss Eileen Adair, niece of Mr. T. Wylie Kay, and Mr. ROLAND WYNN BROADHEAD, of Elland.

Mr. H. A. UNDERWOOD has joined the Board of the Colonial Gas Association, Ltd. He was Chairman of the Williamstown Gas Company, which has recently been amalgamated with the Association.

The outdoor and indoor staffs of the Hereford Gas-Works have combined to make a presentation to the Manager, Mr. A. R. W. ROBERTS, on the occasion of his marriage. The gift took the form of a fine chiming clock, with a suitable inscription.

OBITUARY.

The funeral took place at the Exwick Road Cemetery, Exeter, on the 20th inst., of Mr. H. J. WESLAKE, who died at his residence, "Franklyn," Cowick Lane, on the preceding Sunday. Mr. Weslake had for a number of years been a Director of the firm of Messrs. Willey and Co., engineers, of Exeter, and was chief of their meter department. There was a large attendance, which included the majority of the firm's employees. The deceased was aged 63 years. His death is much regretted in Exeter, where he was widely respected.

ELECTRICITY SUPPLY MEMORANDA.

AN interesting editorial article has appeared in the "Electrical Review" on the subject of "Domestic Electrical Requirements." Our contemporary appears to be getting somewhat excited over the prospect of further legislation, which, it is hoped, will give an impetus to electrical development. It views this with much approval, because, in its opinion, it has carried the propaganda movement a big stride forward—so much so that it encourages the belief that the "majority" of people are talking and thinking electrically. That is a big claim; but there is something more abstract about it than there is about the concrete evidence we have that, for one or more or several purposes, gas is used by the majority of householders. Even by a number with electric cookers, gas is employed for accelerating and cheapening household operations. However, our contemporary also nurses the view that this progress has created a new atmosphere congenial to the growth of a much larger trade in electrical apparatus; but it is easy to detect a feeling on its part that what is wanted is the discovery and development of new and improved devices. This indicates the existence of the view that the present types are not all that they should be; and, of course, there is not room for a shadow of doubt as to that. Defects, risks, and limitations are well known to the electrical man, though he does not shout about them from the housetops. Yet of types there have been countless productions. With all the work that has been accomplished during the last three decades, there is still a longing for something better. It is no reflection on those who have worked hard to invent and to improve to say that they have not succeeded in ways that would be preferred and are desirable. They cannot help this. They have obdurate physical conditions with which to contend; and it is not their fault if electrical appliances of necessity contain greater complication and risks of failure than gas appliances, or if a KW.-H. can only develop 3420 B.Th.U. Cheapening the production of electrical energy will not go far towards aiding the work of domestic electrification, unless—and this is more important—householders can obtain a greater efficiency (thermal and time) from appliances that are more reliable, and yet less costly.

Longing for More Efficient Appliances.

Suggestions—The Gas-Electric Cooker!

The "Review" should remember that the greater the diversity of appliances of the same type and for the same purpose, the greater the cost of their production. Cost of production, through the more complex character of electric appliances, is more than that of gas appliances; and yet our contemporary urges that increased attention should be devoted to the actual needs and even the "fancies" of the consumers. The "fancies" of consumers are of a multitudinous character; and manufacturers would tell the "Review" that, if they have to incorporate individual fancies in their designs, the cost would be increased, and not diminished. It asks two questions: "Is our ingenuity as fertile as it should be in the discovery and development of new and improved devices? Are those interested in the manufacture and production of electrical appliances ready to adopt new ideas and make contrivances which are an advance on what they already produce?" It is patent that the "Review" knows well the extent to which gas boiling-rings have been adopted where electric cookers have been installed—to the regret, in many cases, of those who have to use them, having paid the tall price of installation; for it asks the question, "Is even a gas-electric combination necessarily an abomination?" And it rubs the point in by saying, "Is there any substantial evidence to show that either designers or manu-

facturers are seriously facing the problem of the electric cooker boiling-ring which has been the subject of comment in our 'Correspondence' columns? [See "JOURNAL," p. 575.] Propaganda is good; but it will suffer from the efforts of the counter-propagandist unless there be a solid foundation of truth and efficiency." Those last ten words are excellent and appropriate; for many electricity consumers (as gas men well know) have found that there is not always a "foundation of truth and efficiency" in what they are told. The gas industry does not mind straight and clean competition; but when it sees its own business attacked by statements which have not a foundation of truth and efficiency, then its men feel duty bound to scatter a little enlightenment. To pass on. The "Review" urges that no effort should be spared to simplify the use, adjustment, and repair of domestic electrical apparatus. It points out how the manufacturers of plant and appliances and the suppliers of electricity are co-operating in research and in commercial development; and, in conclusion, it asks why they should not go a step further, and set-up a committee of experts, to examine and report upon the domestic applications of electricity, and to indicate the directions in which progress can be made for the benefit of the whole industry. Really it is astonishing, with all that has been done to attain to a better state of things in connection with electrical equipment, that the satisfaction of such an authority as the "Review" has not yet been achieved. It must be a heart-breaking business—looking over the past, and then upon the results, and taking measure of what has still to be done.

The Deficient Boiling Plate.

In the "Memoranda" for the 13th inst., reference was made to the actual personal experience of a correspondent in the "Review," signing himself "Cuisinier," who spoke of the dissatisfaction of friends with electric cookers—particularly with boiling rings, and who called to their aid the gas boiling ring. He also pointed out that a self-contained kettle should be supplied with every electric cooker; and we asked, If a kettle, why not self-contained saucepans? It may also be pointed out that a gas-ring and an ordinary kettle are more reliable than a self-contained electric kettle, and far less expensive; and that the same boiling ring can be used for countless purposes, while the self-contained kettle can only be employed for one purpose. "Cuisinier" wrote from Newcastle; and the Newcastle-upon-Tyne Electric Supply Company, Ltd., regard his criticism and revelations as some reflection upon them. Mr. W. F. T. Pinkney, Engineer of the Company's Lighting and Heating Department, has therefore written to the "Review" a letter, in which there is not a trace of denial of the charge of inefficiency brought against those abominations which try to do duty on the hotplate of an electric cooker. Mr. Pinkney no doubt feels hurt over the disclosures, and so he writes to inform the readers of our contemporary that users of electric cookers can have an electric kettle at any time at a small rental, which rental includes the maintenance and the "loan" of another kettle when it is necessary to put the hired kettle into hospital. The Company, in fact, make a practice of recommending the use of an electric kettle. Mr. Pinkney says that "Cuisinier" agrees that an up-to-date cooker, with an electric kettle, will make electric cooking the only method worthy of consideration. It is a pity that electrical people so readily accept such illusions. We ask once again why, if electrical kettles are so essential to the success of an electric cooker, self-contained electric saucepans are not equally necessary, for they are important participants in the cooking operations.

That Low Thermal Efficiency.

An extremely interesting address was delivered by Prof. G. W. O. Howe, of the Glasgow University, before the Engineering Section of the British Association at their Toronto meeting. In the course of this, he spoke of the low efficiency of the production and utilization of electrical energy—a point regarding which most electrical engineers are very touchy. He mentions that the over-all efficiency of a small power station supplying a lighting load, and having a very poor load factor, is not greater than about 6 p.ct. from coal to switchboard. It might have been added—perhaps it was in the original paper—that the efficiency varies from that point in different stations up to 18 p.ct. in the most modern of large power stations with more congenial loads. Even an efficiency of 18 p.ct. is nothing of which to boast. Then in use not more than about 2 p.ct. of the energy delivered to a carbon filament lamp is radiated as light; so that the over-all efficiency from coal to light is 2 p.ct. of 6 p.ct., which means that, of every ton of coal burned at the power station with the object of producing light, all but 3 lbs. is lost as heat at the various stages of transformation. With modern steam plant and gasfilled lamps, the over-all efficiency from coal to light is equivalent to no more than 40 to 60 lbs. of each ton of coal. Prof. Howe also compares anthracite heating with electrical heating. Paying £5 per ton for anthracite to burn in a slow-combustion stove, he takes the calorific value of the anthracite at 9000 KW.-H. per ton, which is equivalent to 14,000 B.Th.U. per lb. This works out to 7½ KW.-H. for 1d. For electrical energy for heating and cooking, the cost is 1d. per KW.-H. This ratio of 1 to 7½ corresponds fairly closely to the over-all efficiency of the power station. In view of the high efficiency and convenience of slow-combustion stoves, electric heating, Prof. Howe says, cannot be expected to compete with them for continuous operation. He might have gone further, and compared labour-saving gas with electricity. But he did not.

The New Regulations.

The contributor of "Cooking and Heating Notes" in the "Electrical Times" discusses the question as to the effect that compliance with the new regulations of the Institution of Electrical Engineers for the equipment of buildings will have upon the design and cost of electrical appliances. The value of the regulations will depend on the extent to which they can be, and are, enforced. No doubt manufacturers will produce appliances complying with the rules if there is a real demand for them, and their manufacture is a sound business proposition; but the attitude of the supply engineers and the contractors will be the deciding factors. "One thing certain is that compliance with the regulations will increase the prices of appliances to a greater or lesser degree." The question is, Is the cost of appliances to rule design which contributes to safety? It should not be a question as to what the manufacturers or the supply undertakings and the contractors will do which should determine this matter, but what will improve safety and efficiency. The same argument applies to the submission that an increased price will not make competition with non-regulation and imported articles any the easier. The prospect of an increase in prices apparently appals our friend. He points out that it must not be forgotten that even the existing price standards give rise to a good deal of criticism; the price factor in the past has been sufficiently strong to make practically inoperative many of the old regulations. That makes the position worse than ever, as, if the old regulations, which were designed to procure a greater reliability and safety, had the effect of acting as a deterrent to adoption owing to cost, then the more stringent regulations designed further to improve the situation in respect of these important considerations stands small chance of adoption, unless supply authorities and contractors change their attitude.

An Examination of Points.

It is a strange thing to find well-considered efforts to raise the standard of domestic appliances being attacked. It is admitted that the new regulations demand a high standard of excellence; and the question is asked by the writer in the "Electrical Times" whether compliance with the rules will ensure practical advantages commensurate with the increased cost their adoption involves? If the regulations would ensure an increased measure of reliability, safety, and working efficiency, then it would be very difficult to deny that the increased cost would be money well spent. Those are things which cannot be subject to any formula to determine value. The rules relating to earthing are considered. No. 103 provides that "all current-consuming devices whether portable or fixed, designed for pressures exceeding 100 volts direct current or 30 volts alternating current, shall be provided with a terminal or other suitable means for earthing all exposed metal liable to be charged should the insulation become defective." The critic points out that few connectors now on the market are suitable for use with triple flex, circular braided, which is obviously demanded—particularly in view of the increased over-all diameter involved. Twin single connectors, which are still largely used, present their own difficulties. It is not denied that the alterations necessitated would produce improvement; but the increased cost to the user would be "appreciable." The advantages of greater strength of the larger flexible, and increased stiffness due to its being made up into a single cable, should "materially increase its life, and provide greater immunity from breakdowns than is at present the case." Then there is this admission: "As something like 50 p.ct. of the trouble with small appliances to-day is due to breakdown of the flex, the increased cost involved in this connection should result in a greater degree of reliability, and would be well justified on that account." As regards the provision of earthing terminals, it is feared it would have the effect of neutralizing much of the development in design and construction which has taken place during the last few years. The critic belittles the requirement so far as the "majority" of domestic appliances are concerned — the "majority" being the small fry among such appliances. The large Committee of experts who had the regulations under revision —and revised them in the light of a longer experience than they had had when previously considering them—must have weighed all the points that the critic advances. Nevertheless, he opposes the conclusions of the Committee, when he says: "While earthing the frames of electrical appliances such as are used in bathrooms and similar situations is essential in the interests of safety, we are led to the conclusion that, as regards other domestic appliances, there is not sufficient advantage to be gained by this practice to ensure its general adoption, particularly in view of the deterrent influence of the cost factor." A feeble little comment by "Meteor" in the same issue says: "When we remember that electricity for domestic purposes is so safe that any comparison with gas would be preposterous, why, we would ask, does the industry so unnecessarily handicap itself in the race?" Why, indeed? Put the question to the Committee of experts, who are anxious for the well-being and good reputation of the industry. Their method is the way of stability in progress, and that way is better than working along a path in which dissatisfaction exists. The district men of gas undertakings meet with a great deal of that dissatisfaction on the part of people with electrical appliances,

who are not in the habit of hiding it when talking to a listener who knows how to give relief.

Prices. Looking down the prices of electric appliances published by "Electrical Industries," we see that boiling-rings are priced at 20s. to 47s. 6d.; clothes washers £30 to £50; cookers run from £15 15s. to £30; fires, 18s. 6d. (600 watt) to 63s. (3 KW.) and upwards; irons, 16s. 6d. to 61s.; and 2-pint kettles 22s., up to 70s. for 6-pint.

A GAS GEYSER SPECIFICATION.

[PUBLISHED BY PERMISSION.]

The following report of the Gas Appliances Specification Sub-Committee of the National Gas Council, together with a specification of suggested constructional features to be embodied in the manufacture of geysers, has received the approval of the Central Executive Board.

May 8, 1924.

TO THE CHAIRMAN, GAS APPLIANCES SPECIFICATION COMMITTEE OF THE NATIONAL GAS COUNCIL.

SIR,

GEYSERS.

On Dec. 11, 1922, we were requested by your Committee to continue our investigations into the structural features of geysers, and to prepare a further report.

In view of the increasing use of geysers, it has been considered advisable to review the main constructional features which should be embodied in a geyser, and we append hereto a specification which we suggest should be published as a basis for the future construction of geysers.

Since that date we have been requested to consider the Draft Model By-Laws and Specification issued by the British Waterworks Association, to ascertain what would be their effect upon the use or sale of gas-heated water apparatus.

A Conference took place between representatives of the British Waterworks Association and representatives of this Sub-Committee on May 11, 1923, the outcome of which may be considered satisfactory. The Ministry of Health have since decided themselves to proceed with the amendment of the Model By-Laws and the preparation of a specification; and it has consequently been necessary for this Sub-Committee to deal with this question afresh. Members of the Sub-Committee on behalf of the Council have appeared before the Ministry of Health and submitted certain amendments to the Ministry's Provisional Specification. It is satisfactory to record that the Ministry have since revised the Draft Specification in accordance with the suggestions made to them on behalf of the Council.

Our investigations have revealed the fact that, though manufacturers have made progress in the latest types of geyser, there is not sufficient safeguard against accidents resulting from misuse of geysers or from the use of geysers improperly fixed.

Further, there appears to be considerable evidence of lack of supervision of the persons who fix the apparatus or co-operation between them and the gas undertakings. With a view to ensuring reliable work and satisfactory results, we consider that, in the interests of consumers and gas undertakings alike, it is essential to insist upon the following main points being strictly adhered to in the construction and fixing of geysers:

(1) All geysers should preferably be fitted with an automatic dual gas and water valve, so that the gas to the burner will be automatically reduced to the by-pass jets in the event of the failure of the water supply for any reason. Two types of automatic dual valve are recommended—one to work in conjunction with a geyser with a visible break in the water supply, the other with the type of geyser where the water supply is connected direct to the water-main. It is realized that there is still a large demand for geysers with interlocking taps, and these taps, when strongly made and properly designed, are quite safe; but the Sub-Committee consider that the geyser fitted with an automatic dual valve is preferable.

(2) All geysers should have swing-out burners made of cast iron and fitted with luminous jets, a spiral groove to be cut across the plug of the fitting, so as to retard the full volume of gas until the burner is in the proper position in the geyser.

(3) Geysers should be constructed in five sizes, the number being clearly shown on the badge plate:

Size No. 1	to have a capacity of	1	gallon per minute.		
,, 1½	,,	1½	gallons	,,	
,, 2	,,	2	,,	,,	
,, 3	,,	3	,,	,,	
,, 4	,,	4	,,	,,	

(4) All geysers should be capable of giving the quantities of hot water specified in the preceding paragraph at the highest possible temperature in the time stated, and with the lowest possible gas consumption. A minimum temperature rise of 60° Fahr. at the specified rates of flow should be guaranteed with a definite consumption of B.Th.U. In the Sub-Committee's opinion geysers should give a minimum thermal efficiency of 80 p.ct.

(5) In the opinion of the Sub-Committee the existing type of instruction plate, constructed of a brass plate with stamped lettering, is not sufficiently legible; and it is recommended that an instruction plate (preferably of enamelled iron, with white letters on a salmon-red background) should be affixed to the geyser immediately over the spout, lettered in accordance with the Specification.

(6) All geysers should be made with both right and left hand connections for the spout and hot water supply to lavatory basin.

(7) *Ventilation.*—It is essential that the room in which the geyser is fitted should be adequately ventilated, in such a manner that the ventilation may not be interfered with, but remain permanent. The vent pipe must be rigidly fixed, and not less in diameter than the flue spigot at the top of the geyser, and carried into the nearest chimney flue or through the external wall. In the latter case a suitable terminal or outside wind-guard must also be fixed. When a chimney is not available, or is defective, and the geyser is fixed immediately under a well-ventilated roof space, the flue pipe may be carried through the ceiling and fitted in the manner described in the book of instructions for fixing geysers issued by the National Gas Council. No geyser should be fixed without a baffle in the vent pipe, as near to the ceiling as possible.

(8) Two instruction cards should be supplied with each geyser—one for the fitter and the other for the user—containing full instructions for the fixing and use of the geyser.

(9) Special attention should be paid to ensure that ample service and meter capacity is available where a geyser is to be fixed. Investigation has shown that unsatisfactory results in some cases are due to the fact that geysers have been connected to inadequate services and meters.

(10) Wherever possible, a separate supply pipe should be run to the geyser direct from the outlet of the gas meter.

(11) The interchangeability of parts and facilities for cleaning and maintenance should be carefully studied. The internal portion should be capable of being easily removed for repair, &c.—preferably in one piece.

The Sub-Committee have compiled, and suggest the publication of, a small instruction book, giving full particulars and sketches of how geysers should be fixed. It is suggested that the booklet should be published by the British Commercial Gas Association in collaboration with the Gas Appliances Specification Sub-Committee, and that it should be issued on completion to all gas undertakings, for the use of gasfitters and local plumbers, and also circulated to the Technical Press and building periodicals.

The Specification attached hereto has been submitted to representative geyser manufacturers, and at a conference held on March 27 was approved by them.

(Signed) R. J. ROGERS, Chairman.
,, HARRY CLARK } Joint
,, E. C. HOLT } Secretaries.
Gas Appliances Specification Sub-Committee.

Specification of Desirable Constructional Features to be embodied in Geysers.

The following constructional features are regarded as of special importance, and should be adhered to in geyser manufacture:

Sizes.—The geysers to be constructed in five sizes, and the numbers 1, 1½, 2, 3, or 4 plainly indicated on the maker's badge plate.

Capacity.—The capacity of each geyser to be indicated as follows:

Size No. 1	with a capacity of	1	gallon per minute.		
,, 1½	,,	1½	gallons	,,	
,, 2	,,	2	,,	,,	
,, 3	,,	3	,,	,,	
,, 4	,,	4	,,	,,	

with a minimum temperature rise of 60° Fahr.

Efficiency.—All geysers to be capable of giving the specified quantities of hot water at the highest possible temperature in the time stated, and with the lowest possible gas consumption. A minimum temperature rise at the spout of 60° Fahr., at the specified rates of flow, and a minimum thermal efficiency of 80 p.ct. must, however, be guaranteed with a definite consumption of B.Th.U.

General Construction.—Each geyser to consist of the four following principal parts:

A. *The Base* containing the burner and swivel door and connection, also the condense channel and enclosed bottom plate, should be of cast iron or copper, and the bottom of same completely enclosed.

B. *The Body* containing the outer jacket, the inner lining, the top water distributor, the annular or other sectional water chambers or boilers, also the water spout and inlet water connections.

C. *The Cover or Top Cap*, including the flue outlet spigot.

D. *The Automatic Valve*, with swivel connection to gas-burner float.

Outer Water Jacket.—(*a*) The outer case to be constructed with a lining to form a cold-water jacket, in all sizes of geyser.

"Sealed" Geysers.—(*b*) The products of combustion should pass through the apparatus in such a manner that they cannot come into contact at any point with the water, either directly or indirectly. This is more clearly defined as follows:

Neither the products of combustion nor the products of condensation must come into contact with the water. The geyser to be con-

structed of the absolutely sealed type in all sizes, so that any contamination of the water passing through the geyser is entirely avoided.

Gas Flames and Burner.—(*c*) These should be of the flat-flame or luminous type, burning in ample combustion space, the jets to be properly screwed into a cast-iron burner or indented copper tube or tray. The cast iron, if used, must be subjected to anti-rust treatment.

Weight of Metal for Internal Parts.—(*d*) All internal surfaces of the geysers which are exposed to the products of combustion, should be constructed of heavier gauge in each case than the outer casing; the latter being the only part where the metal may be slightly lighter in weight (see schedule).

In the schedule three gauges of copper are specified, the heavier gauge for the internal parts where the wear and tear are greatest, and the lighter gauge for the outer case, which is not exposed to the corrosive products.

Metal to be Covered by Water when Gas Alight.—(*e*) All parts of geyser in contact with flames or heat to be completely covered by water, when at the minimum rate of flow.

Dual Gas and Water Valves.—(*f*) All five sizes of geyser should be fitted with a "dual gas and water" valve of a reliable type, permitting of the necessary flow of gas to the burner immediately the water is turned on, the same valve to come into immediate operation directly the water is turned off.

The gas supply must not be allowed to come on fully in the geyser until the burner is pushed back into the geyser, and then the dual gas and water valve opened.

The water supply will, in this case, operate in conjunction with the gas valve, so that, should the water be shut down at the main supply, the gas flames are reduced on the burner jets automatically. The valve must operate freely with varying water pressures, and fulfil the functions of a safety-locking tap.

Gas and Water Connections.—(*g*) These should be of heavy hard brass or gunmetal, and the watercocks should meet the requirements of the water authorities, and be so applied as to permit of right and left hand positions. The word "Gas" should be boldly embossed on the upper face of gas-cock fan, and the words "Water, turn slowly," similarly embossed on the front of the water-tap handle.

Enclosed Base Plate.—(*h*) All geysers to be constructed with the base enclosed sufficiently to prevent condensation, &c., from falling into the bath, hand-basin, or sink, &c., over which it may be fitted.

Tinning.—(*i*) All those parts of the geyser with which the water comes into contact must be completely covered with 95 p.ct. *pure* tin.

Top or Cap.—(*j*) The geyser top or cap should be spun to facilitate the outflow of products. Where a geyser with a removable top is made, this point does not arise; the flue outlet coming directly through from the combustion space.

Weight and Gauges of Metal.—(*k*) All copper to be of the best hardened quality except for any spinnings required, which may be of the best soft cold-rolled sheet, in accordance with the weights and gauges shown in the schedule.

Instruction Plate (*for use with geysers with automatic dual valves*).—This plate to be affixed immediately over the spout and to be enamelled with plain lettering (preferably with white letters on salmon-red background) as follows:

1. Well ventilate the room.
2. Swing out the burner.
3. Turn on gas tap and light burner jets.
4. Swing in the burner slowly.
5. Turn on water tap slowly.
6. Turn off gas before entering bath, and again make sure that room is well ventilated.

SCHEDULE OF DIMENSIONS, METALS, &c.

	SIZES. No. 1.	No. 1½.	No. 2.	No. 3.	No. 4.
Capacity in galls. per min. to be not less than	1 gall.	1½ galls.	2 galls.	3 galls.	4 galls.
Over-all heights to top of body (excluding flue spigot) should not exceed	24 in.	27 in.	30 in.	36 in.	42 in.
THE BASE.					
Width of base complete should not exceed	8½ in.	11 in.	12 in.	13 in.	15 in.
Door opening—width not to exceed	9½ in.	11 in.	12½ in.	13¼ in.	15 in.
Depth not to exceed	2¼ in.	2¼ in.	2¼ in.	2¼ in.	2¼ in.
Burner—approx. diameter	6 in.	7 in.	7 in.	8 in.	8½ in.
Water connection (internal diameter) to be not less than	⅜ in.	½ in.	⅜ in.	½ in.	¾ in.
Gas connection (internal diameter) (iron threads)	½ in.	¾ in.	¾ in.	1 in.	1 in.
Diameter of draining pipe in channel of base (brass threads)	⅜ in.	⅜ in.	½ in.	½ in.	½ in.

THE BODY. Weight of copper to be used for body construction:	Nos. 1, 1½, and 2. lb.	S.W.G.	No. 3. lb.	S.W.G.	No. 4. lb.	S.W.G.
Outer jacket	8	24	10	22	10	22
Lining to outer jacket	10	22	10	22	12	21
All internal chambers, &c.	10	22	10	22	12	21

WEIGHT AND GAUGES OF METAL.

Where the weights of copper are given, the gauges are also shown—*i.e.*,

12 lbs. copper No. 21 S.W.G.
10 ,, ,, No. 22 ,,
8 ,, ,, No. 24 ,,
} 4 ft. by 2 ft. sheets.

SPOUTS.	No. 1.	No. 1½.	No. 2.	No. 3.	No. 4.
Over-all protrusion (including boss) should not exceed	5 in.	5½ in.	5½ in.	5½ in.	5½ in.
Diameter of spout	1 in.	1¼ in.	1¼ in.	1¼ in.	1¼ in.

TOP CAP AND FLUE SPIGOTS.										
Flue spigots, dia. not to be less than	3½ in.		4 in.		4½ in.		5 in.		5½ in.	
Weight of copper for same	lb. 8	S.W.G. 24	lb. 8	S.W.G. 24	lb. 8	S.W.G. 24	lb. 8	S.W.G. 24	lb. 10	S.W.G. 22

Report and Specification approved and adopted by the Gas Appliances Specification Committee on May 8, 1924.

A small book of instructions for fixing geysers (intended for the use of gasfitters and plumbers) has also been compiled by the Gas Appliances Specification Committee and approved by the Central Executive Board.

This book, which will contain illustrations of the right and wrong way of fixing geysers, is being published by the British Commercial Gas Association, and will be issued to members of the Council in the near future.

EARLY GAS EXPERIMENTS.

Referring to the publication, on p. 250 of the "JOURNAL" for July 9, of a sketch of apparatus used by George Dixon, of Cockfield, for experiments on coal, the "Co-Partnership Journal" of the South Metropolitan Gas Company says—

About the year 1760 Dixon heated coal to ascertain the quantity of tar obtainable from it, and accidentally ignited the issuing gases and vapours, causing an explosion which wrecked the apparatus. We note the contribution to the early history of coal distillation, but we can assure those who claim Dixon as the inventor of gas lighting that the evidence in support of their claim is not of much importance. Dr. John Clayton, Rector of Crofton, had distilled coal and collected the gas at least three-quarters of a century before; Dr. Stephen Hales, Vicar of Teddington, had published a sketch of an apparatus for distilling coal in 1727; and in connection with the early experiments of Lord Dundonald there is evidence that the gas which issued from his tar apparatus was ignited and used to light the workmen at their duties. Murdoch's claim to the invention of gas lighting rests upon the fact that in 1782 he manufactured gas from coal, conveyed it through pipes, and applied it to the lighting of his house and offices at Redruth. Blowing a tar plant to pieces is not quite the same thing as inventing gas-lighting.

We are not ignoring the statement of John Bailey in 1810 concerning Dixon's further experiments—the heating of coal in an old tea-kettle and "luting hemlock stems with clay to the spout." Such records are quite interesting; but Dr. Clayton had done much more than that in the preceding century.

Gas Delivered by Wagon.

The London Portable Gas Company was formed in connection with a patent taken out by Gordon and Heard in 1819 for compressing gas into strong copper or other vessels, fitted with valves to regulate its emission; and subsequently compressed gas was introduced into Paris, only to be abandoned after some years of profitless operations. For the purpose of this compressed supply, small holders were placed on the consumers' premises, each having a pipe of communication to the street, on which was a tap. The gas was conveyed from the works by a van fitted up as a holder; and this being connected to the pipe of the consumer's holder, the gas was transferred. Each van contained some 300 or 400 c.ft. of gas. It seems that something of the same kind was undertaken many years back in the United States. In 1850, Dr. William F. Danowsky, of Allentown (Pa.), erected a small coal-gas plant in the yard of his home, for the purpose of furnishing himself with this commodity; and not long afterwards he was induced to lay zinc mains to supply a few people in his immediate neighbourhood. Then other people further away also desired a supply; but the expense of laying mains stood in the way. This led to the suggestion that persons who wished for a supply of gas should provide themselves with rubber or leather bags to be kept in their cellars or other convenient places, where they could be connected to the house pipes. These bags were replenished as often as they became empty from a huge rubber bag which, after being filled at the works, was carted to the residences of the customers. The large bag was connected to the small one, and then weighted to force the gas into the small one. Afterwards the small bag was weighted to force the gas into the house pipes. However, about 1852 a company was formed; and with the erection of larger works, mainlaying operations were extended.

Manchester District Institution of Gas Engineers.—Mr. William Rogerson (the Hon. Secretary) intimates that the next general meeting of the Institution will be held on Friday, Oct. 24, at Runcorn and Widnes.

North British Association Golf Outing.—We are informed by Mr. J. O. Scott, of New Grange Works, Edinburgh (the Hon. Secretary of the North British Association Golf Club), that the annual golf outing will take place over the Pollok Golf Course, Pollokshaws, Glasgow, on Wednesday, Sept. 3, at 2.30 p.m. (the afternoon preceding the meeting of the North British Association of Gas Managers). The Challenge Bowl, together with scratch and handicap prizes, will be played for by strokes under medal rules. Partners will be balloted prior to the competition. The course is easily reached from Glasgow, either by Thornliebank tram car to Pollokshaws West, or by train from St. Enochs Station at 2.2 p.m. to Pollokshaws. Arrangements have been made for the provision of caddies. The entry money is 2s. 6d. Those who have not already given notice of their intention to take part should send intimation as soon as possible to Mr. Scott, together with club handicap and bogey of home course, so that the necessary arrangements may be made.

TECHNICAL NOTES FROM THE SOCIÉTÉ TECHNIQUE MEETING.

[From "Le Génie Civil," July 12.]

In previous years it has been our practice to select, from the numerous papers usually presented at the annual meeting of the Société Technique de l'Industrie du Gaz en France, those of the greatest interest for abstract translation. This year, however, opportunity has so far occurred for the publication of only one paper (that on "Activated Carbon and Silica Gel," *ante*, p. 449); and it is now proposed to make use of the excellent abstracts of the communications which appeared in the columns of our esteemed contemporary "Le Génie Civil" for July 12, 19, and 26 which numbers have been kindly sent us.

SILICA REFRACTORIES IN THE GAS AND COKE INDUSTRIES.

M. G. Bia, after introducing his subject with general remarks on the properties of modern refractories, showed in the following table the characteristics of the allotropic forms of silica (figures according to Le Chatelier-Eudel):

Modification of SiO_2.	Sp. Wt.	Sp. Vol.	Limits of Stability °C.	Limits of Existence °C.
α—quartz . . .	2·65	0·3773	150–575	150–575
β—quartz . . .	2·633	0·3798	575–900	575–1685
α—crystobalite . .	2·33	0·4292	20–230*	20–230
β—crystobalite . .	2·21	0·4525	1470–1685	230–1685
α—tridymite . . .	2·32	0·4310	20–130*	20–130
β—tridymite . . .	2·32	0·4310	900–1470	130–1685

* Relatively stable; really permanent as quartz.

The transformation of quartz into β-tridymite involves a 20 p.ct. increase in volume; but, starting with primary materials which give tridymite on the first heating, it is possible to obtain a brick which shows an expansion of only 1 to 2 p.ct. Among such primary materials M. Bia mentioned: (*a*) The rocky quartzites of the Devonian and Silurian strata, of moderate purity and a fusion point above Cone 36; (*b*) carboniferous sandstones, which under the microscope appear to differ little from (*a*); and (*c*) tertiary quartzites of basaltic structure which are found coincident with lignite. It is with the last class that the author considers the best silica brick can be made, the material being obtainable in the Rhine Valley, Hesse, Saxony, Czecho-Slovakia, Transylvania, and in certain parts of Russia and Italy. Up to the present none has been discovered in France, England, or the United States.

Silica bricks from the Horni Briza Works at Prague contain 91 to 95 p.ct. of SiO_2 and a small quantity of Al_2O_3, Fe_2O_3, and CaO. The porosity of first-quality silica bricks the author gives as 8 to 10 p.ct.; and a test of permanent expansion—by heating a brick ten times to 1500° C. under a load of 4 kg. per sq.cm.—gives a result of less than 2 p.ct. with bricks manufactured from these tertiary quartzites. Silica brick displays a greater resistance to surface abrasion than does firebrick.

The Koppers Company, of America, first employed silica bricks for coke-ovens in 1908-9; and the practice took hold more slowly in Europe, probably owing to the fact that in America unwashed coals, containing at most 4 to 5 p.ct. of water, are used for coking, whereas in Europe washing is essential. This means a water content of 12 to 16 p.ct., and it was feared that silica would not stand-up to rapid fluctuations in temperature. Shortly after the war, however, certain firms began to introduce the segmental silica retort; and now this predominates in Central Europe.

Such retorts behave well, although the interior temperature (1000° to 1050° C.) falls to 650° C. upon discharge, to rise again to 850° C. as soon as the doors are closed on a fresh charge. The joints in the structure tighten, indeed, as the temperature rises. With good-quality silica the thickness of the walls may be reduced to 35 mm., temperatures can be carried up to 1250° C., and the period of carbonization shortened, providing heats are carefully controlled. The employment of silica has enabled coking times, first in America, and later in Europe, to be reduced from 29 hours to 24, from 24 to 17, and latterly from 17 to 12 hours.

The very slight expansion of a first-quality silica brick is an advantage, as it tends to close-up and strengthen a setting; and, of course, one must remember to allow not only for this permanent expansion, but for the temporary variations which take place under working conditions. Aluminous material, on the other hand, often contracts, making necessary the filling of the joints; though a brand of firebrick is now manufactured which expands permanently in a setting.

M. Bia concluded with the opinion that the gas industry would in the future entirely favour the employment of silica.

In the discussion which followed, the President (M. Rouland) asked whether the silica segments had not to possess a geometrical precision; also whether the high heats in the retorts did not tend to bring the calorific power below the prescribed limit. Mr. Stein remarked that the accuracy put into the manufacture of silica in America was so great that in commencing the building of a coke-oven wall from opposite extremities there was no cutting of the bricks to be done. The quality of the gas from quick-coking settings was always satisfactory; the diminution of coking time being mainly due to the fact that ovens were now designed of much smaller cross-section—the thickness of coal being little more than that in gas-works retorts.

M. Widemann, and also M. Rivière, of the Cie. Générale de Construction de Fours, mentioned laboratory experiments which showed that the specific conductivity of silica was slightly less than that of silica-alumina material; but M. Lahovsky (Czecho-Slovakia), of the Sté. des Produits Réfractaires de Prague, was supported by M. Bia in saying that in these experiments good silica-alumina bricks were compared with bad silica bricks.

M. Stein said that conductivity varied with compactness. In practice it mattered little which coefficient of conductivity (so ill defined) was the higher, for the fact that the softening point of silica was very high permitted considerable reduction in the thickness of the refractory wall. He emphasized this characteristic by pointing out that coke-ovens could be built with sides 4 m. in height, which was impossible with silica-alumina. M Widemann challenged a statement that had been made to the effect that the Czecho-Slovakian bricks had a density of only 2·4; in his opinion they were originally heavier, but diminished in density as the allotropic changes took place. He had formed an idea that silica brick was less resistant to wear than silica-alumina, because the latter was used for the bottoms of coke-ovens with silica side walls. The author explained, however, that silica for this purpose was unsuitable because of the high water content of the coals normally carbonized.

(To be continued.)

THE GERMAN GAS ASSOCIATION.

Annual General Meeting at Nürnberg.

From reports appearing in recent numbers of the official organ, "Das Gas- und Wasserfach," we are able to place on record a short account of the sixty-fifth Annual General Meeting of the German Gas Association, held at Nürnberg on June 26, 27, and 28. We hope to give fuller translations of some of the papers as these appear in our German contemporary. At the meeting they are only presented in manuscript.

THE REPORT OF THE COMMITTEE.

In their report for the past year, the Committee refer at some length to the final period of hopeless inflation in Germany, before the stabilization of the currency on the gold mark basis. When it is realized, as they state, that between the last meeting in June, 1923, and Nov. 20 the mark depreciated 28,000-fold, some idea can be gained of the difficulties with which gas undertakings were faced in regard to charges as compared with production costs. Naturally, all kinds of systems had to be hurriedly devised as substitutes for the ordinary methods of payment. That the industry, with its special difficulties, survived such trying times is, the Committee consider, a tribute to the courage and far-sightedness of its leaders. For its great and sympathetic help to gas and water undertakings throughout, they addressed a special memorandum of thanks to the Reichsbank.

One feature of note is stressed on the technical side. Lower calorific values have come to stay. Introduced as a war and post-war measure, chiefly by the addition of more water gas, they have won approval from the economic standpoint, and, among many gas men, even when the reduction is due to inerts. [On this subject a paper was read.] In this connection, benzole extraction is also mentioned. It still remains for the German gas industry to decide whether the practice is still as advantageous from the national and economic point of view as it was in the years immediately following the war.

Interesting material may soon be forthcoming from the Commission on Mains and Services, which is nearing the end of a long investigation into internal resistance to gas flow. After carefully preparing formulæ from the theoretical point of view, a start is being made with practical experiments from which much useful information should be forthcoming.

THE PRESIDENT'S ADDRESS.

On the opening day, the President, Herr Meyer, of Dortmund, offered his greetings to an assembly of 600 members, besides several guests, among whom were the President of the Swiss Gas Association, and a representative of the German Association of Electricity Works. In his opening address, he referred once again to the period of inflation, and the subsequent stabilization of the currency, which brought with it its own particular difficulties in the shape of a great shortage of ready money. These were accentuated by the strike in the German coalfields, and the consequent necessity of importing increased quantities of English coal, and by a slump in the bye-product market which had not been equalled in thirty years. He wound up with an exhortation to the gas industry to pursue to their utmost capacity methods of propaganda for the increase of gas consumption, and a note of hope that the world in general might soon realize that prosperity could only come by work, peace, and mutual understandings.

TECHNICAL PAPERS.

The papers opened with an economic subject, "Present Day Problems of Industrial Organization" being dealt with by Prof. Dr. Wiedenfeld, of Leipzig. An interesting paper, by Dr. Bertelsmann, of Berlin, and a lively discussion followed, on the subject of "The Influence of Inerts on the Practical Applications of Gas." He introduced, with many figures, a series of experimental find-

ings, from which he maintained that no restrictions should be placed on gas-works with regard to nitrogen and carbon dioxide. They should aim at a uniform calorific value, preferably between 470 and 480 B.Th.U. per c.ft., no matter whether this is achieved by the addition of water gas or producer gas, or not. In a summing-up of the opinions expressed in the discussion, Herr Kobbert, who was then in the chair, decided that the effect of inerts was not proven, and the meeting recommended the whole subject as suitable for examination by the Gas Commission of the Association, with a view to a further report. The next paper concerning gas was presented by Herr Schomburg, and read for him in his absence through illness. The subject was "The Fixing of Gas Prices," a question which is not dealt with almost universally, as in England, by statutory obligations and sliding-scales.

Prof. Dr. Probst, of Karlsruhe, spoke on "Concrete and Reinforced Concrete Troubles in Gas and Water Works," and described, with many illustrations, some causes and preventive measures. Coke was the subject of two papers, Prof. Dr. K. Bunte, of Karlsruhe, discussing "The Influencing of the Structure of Coke during its Formation," and Herr Ludwig, of Munich, "The Use of Coke in the Household and in Industry." Dr. Bunte laid down certain rules which may be followed with advantage to the quality of coke, and enumerated various properties which are required of it for use for various purposes.

The last of the papers was by Dr. Stumpf, of the Karlsruhe Gas Institute, on "The Use of Oils of the Paraffin Series for Benzole Extraction." He claimed for them many advantages, though they are liable in some degree to thickening, albeit not to the same extent as the usual tar-oil washes. They have, he said, an almost unlimited "life," they are free from naphthalene, and they give a primary product free from phenol, pyridine, and other resinous matter, which can, without alkali or sulphuric acid washing, be worked up to over 80 p.ct. commercial benzole.

THE GAS INSTITUTE.

In his report on this, the experimental and research station of the Association at Karlsruhe, Dr. Bunte records another year full of service to the members. A large number of tests were made on plant at various gas-works throughout the country, and samples were received and tested at the Institute. For these expert services, charges are made at cost, or very little more. The report includes analyses of the principal English gas coals which are used in Germany.

A sustained fall in the market value of coke has been a feature with which the Institute has concerned itself, since this has meant dearer coal gas and cheaper water gas. If the fall is to continue, increased quantities of water gas are clearly indicated; but in this case carburation with gas oil will be necessary in order to maintain calorific values at about 480 B.Th.U., which is acknowledged as desirable. In this direction, experiments have been conducted, which hold out considerable promise, on carburation, with products of German origin, in the coke column of the ordinary water-gas generator itself.

Linked with the same question is that of benzole extraction. This is still considered to be commercially sound as matters stand to-day, but it is hinted that circumstances may easily so change as to render it no longer so. The Institute have devoted some attention to the use of German mineral oils of paraffin character as wash-oil, instead of the use of tar oil. They have such undoubted advantages from many points of view, that the subject is considered worthy of the fullest investigation from all technical and economic standpoints, and further investigations are in progress.

RESISTANCE TO GAS FLOW IN PIPES.

The report of the Pipes Commission shows the progress that is being made on the subject of estimating resistance to flow caused by internal friction, to which practically all their attention has been given. They have agreed that the Ledoux flow formula can be accepted as a basis, which gives

$$Q = c.\sqrt{\frac{d^5\,(P_a^2 - P_e^2)}{s.\,l}}$$

where Q = the quantity passing in cubic metres per second at 0°C. and 760 mm., d = pipe diameter in metres, P_a = initial, and P_e the final, pressure in absolute atmospheres, s = specific gravity of the gas estimated on air as unity, and l = the length of pipe in metres.

The constant c is given by

$$c = \frac{\pi}{4}\cdot\sqrt{\frac{R_1 \cdot g}{\lambda \cdot T}}\cdot\frac{T_o}{P_o},$$

and when R_1 = the gas constant for air = 29·2, g = 9·81, T (a mean absolute flow temperature for the year) equals 273 + 12 = 285 °C., T_o = 273 °C. and P_o = 1·033 absolute atmospheres, the value for c becomes

$$c = 0{\cdot}7874\cdot\frac{1}{\sqrt{\lambda}}\cdot\frac{T_o}{P_o} = \frac{208}{\sqrt{\lambda}}$$

As yet there is no agreement as to an estimated value for the resistance λ. Biel and Fritsche have both suggested formulæ, and Stark has put forward another based on experiments by the American Towl with 113 kilometres [about 70 miles] of 200 mm. high-pressure main, and which, according to Weymouth-Towl, is in the very simple form

$$\lambda = \frac{0{\cdot}0084}{\sqrt[3]{d}}$$

The Commission are fortunate in having had placed at their disposal several suitable high-pressure mains in various parts, and tests are even now proceeding with the view of determining what actually is the value of λ. Doubtless some very interesting results will be forthcoming in due course.

RESEARCHES ON PRODUCER PRACTICE.

In "Das Gas- und Wasserfach" for May 10, 17, 24, 31, and June 7, Terres and Schierenbeck published at considerable length a description of some interesting experiments, carried out in collaboration with Brans as long ago as 1919, on producers. In a summary of their work, they state that conditions in different layers of the coke in producers were studied, with the idea of obtaining information which might be of value in their construction and working. More particularly, the objects of the research were centred on four points: First, the determination of the requisite reduction column depth for carbon dioxide and steam; and, secondly, of the quantities of steam which give the best results. Thirdly, information as to the effect of the (free) grate surface in the working of the producer; and, fourthly, as to the relation between the cross-sectional area of the producer and its efficiency.

The experiments were carried out on a producer with a flat grate and one with a steeply inclined grate, and in such a way that gas samples were simultaneously withdrawn, by means of cooled tubes, from various depths of the coke column, and analyzed. In addition, temperature readings were taken at the various points; but, owing to lack of facilities, this work was not as comprehensive as might have been wished. The conclusions derivable from the results obtained are then summarized.

The greatest calorific value is obtainable by air-gas working with moderate steaming. But the use of 0·5 to 0·6 kg. of steam per kg. of carbon causes a diminution of calorific value which is negligible for practical purposes. This means that, with this degree of steaming, equal calorific value can be maintained for an increased output of gas, and a reduction in radiation and convection losses—*i.e.*, an all-round improvement in efficiency.

The carbon dioxide formed in the lower layers, according to the equation

(1) $C + O_2 = CO_2$,

and the steam which is introduced, are reduced according to the equations

(2) $C + CO_2 \rightleftarrows 2CO$

(3) $C + H_2O \rightleftarrows CO + H_2$

to which may be added, to a small degree,

(4) $C + 2H_2O \rightleftarrows CO_2 + 2H_2$

and (5) $CO + H_2O \rightleftarrows CO_2 + H_2$

According to the temperature and the amount of steam introduced, equilibrium through reaction (2) is more or less attained for a distance of about 60 cm. (22·6 in.) above the grate, while equilibrium according to (3) and (4) only follows the introduction of normal steaming (up to 0·5 kg. per kg. of carbon). At heights more than 60 cm. above the grate, reaction (2) resolves itself to the left, so that the carbon monoxide quantity is reduced again, and the carbon dioxide increased. At the same time, according to prevailing temperatures, reactions (4) and (5) may become more or less operative, so that the hydrogen content may also be slightly increased. The water-gas reaction plays only a minor part in the producer process.

In order to avoid the reconversion to carbon dioxide, it is recommended that the gas be taken off at a distance of 70 to 80 cm. (27·6 to 31·5 in.) above the level of the grate. Working with this column depth, 0·5 to 0·6 kg. of steam to 1 kg. of carbon can be used, without any appreciable lowering of the calorific value. If, however, it is specially desired to minimize the formation of clinkers, considerably more steam, according to the nature of the fuel, should be introduced.

The proportion of the free grate area to the total has no influence on the efficiency of the producer. It is, however, affected by the proportion which the total grate area bears to the column cross-sectional area. To produce a good gas, this proportion should be as great as possible, because any widening of the column over and above the area of the grate tends to encourage the formation of "wall gases" of different composition, to the detriment of the quality of the final product. On the other hand, the formation of such gases is countered by sufficient column depth.

As maximum capacity for a flat grate (24-hourly clinkering), the authors arrived at a value of 84 kg. of carbon per sq.m. (17·2 lbs. per sq.ft.) per hour. With continuous clinkering—for instance, in producers with revolving grates or liquid clinkering systems—no doubt higher capacities are obtainable. To arrive at these would require a complete series of tests.

Engineers of the United States Bureau of Mines who visit collieries are instructed to obtain samples of coal for analysis, and to draw up notes on the various features of both mines and equipment. The samples are forwarded to the testing station, and the notes are kept for use in the preparation of material for publication with the coal analyses.

DESIGN AND WORKING OF AMMONIA STILLS.*

By GEOFFREY WEYMAN, D.Sc.

The publication of Mr. Parrish's book has been eagerly awaited. Preceded by a foreword from the President of the South Metropolitan Gas Company, and based on the author's known wide experience, the considerations advanced in it become of particular significance.

The book, the author says, attempts to deal with the fundamental principles underlying the design of stills, preheaters, condensers, dephlegmators, and coolers, with special reference to economy of steam. It will be found that economy in the use of steam runs like a theme through the entire book. In an introductory chapter, the author points to the considerable increase in the cost of steam in late years. The steam for ammonia stills has largely been obtained with breeze as fuel, and in bygone days no one was concerned with economy in the use of breeze. No doubt this largely accounts for the apathy of those concerned in the design of plant, so far at all events as steam consumption is concerned.

In the second chapter steam raising from breeze is considered. Whether a description of boiler furnaces, grates, pan-ash recovery plants, and water softening processes is rightly included, seems open to question, and in fact the author appears doubtful of the last-named section (p. 32). However, the subject is very important at a time when, owing to new and increased demands on steam supply, many gas-works have no surplus breeze to market, and are forced to treat breeze with proper respect. The author does not consider that the best results are obtained when the conditions of a boiler furnace are such that carbon monoxide is generated. It should be remembered, however, that boiler installations have generally been designed to take advantage of flame heat, and unless flame is present very poor results are obtained. In order to secure flame from breeze, carbon monoxide must be generated; but this is best done, not by reducing the primary air, as the author states, but by forcing the fire with a larger air velocity.

In considering possible improvements in an over-all efficieney of 62 p.ct., the use of economizers is suggested. It may be stated that both economizers and superheaters have been fitted for some years on a boiler installation using breeze as fuel and supplying steam to water-gas, benzole, and sulphate plants, with very satisfactory results. It is becoming more common to group boilers together, with the consequence that the steam has to travel some distance to various plants. In such cases a slight superheat is of great advantage. The statement on p. 40 giving the cost of steam supplied to the steam jets is unnecessarily involved, and leads to a cost of 2d., not 1·95d., per ton of steam.

After dealing in an informative manner with the composition of ammoniacal liquor, Chapter 3 is completed with a detailed description of a suitable form of gas liquor storage tank. When a non-volatile oil is used to prevent loss from volatilization from liquor in store, a caution should be given that on no account must oil be allowed to pass into stills or saturators. On one occasion such an occurrence caused the working of a sulphate plant to be so dangerously erratic that it had to be shut down and cleared.

In a general discussion of problems affecting distillation and dissociation (Chapter 4), the author deals with Henry's Law and the calculation of the equilibrium constant denoting the relation between the composition of the vapour and the liquor in distillation. The author would prefer to call an ammonia still a dissociator, but fortunately restricts this term to apparatus in which "decarbonation" and "desulphurization" is effected prior to distillation in the production of ammonia solutions. One may agree that superheated steam possesses no great advantage over dry steam, but generally speaking a slight superheat ensures dry steam, and is of great benefit. This short chapter contains much useful matter, and might have been expanded.

In Chapter 5 intermittent and continuous operation is contrasted; and this brings us to the important section of the book dealing with the design of ammonia stills. After treating the existing types of stills, the author discusses the different factors to be considered in the design of an ideal still. The heat to be supplied is calculated as the sum of the heat of solution of ammonia, hydrogen sulphide, and carbon dioxide, and of the heat of neutralization of the dissolved gases. In Table 20 the heading "Heat of Formation" should read "Heat of Neutralization." The items under this heading are evidently meant to be thermal equations, but incorrect signs and the absence of "aq." from the first item makes the statement confused. It is also exasperating to have to pick out the answer from a proportion sum. Unfortunately, a further trial awaits the reader in Table 21, showing heat balances taken from Chapter 9. In spite of this convenience, one has to turn to Chapter 9 to find the quantities and strength of liquor on which the table is based. Apart from this, the distribution of heat and the various sources of thermal loss are clearly indicated.

A consideration of the factors affecting still design, questions of seal, velocity of vapour, entrainment, and so on, is particularly useful, and applicable to many operations carried out in a gas-works. In connection with the capacity of stills, it is stated that the height of existing types invariably remains unaltered, but the diameter is varied according to the required capacity. Firm "D," apparently, is the exception which proves the rule. A large number of different stills are described and illustrated. Indeed, from p. 106 to p. 114 the figures of the various parts of stills are so numerous that, in spite of ingenuity on the part of the publishers, the text gains a few pages in advance of the appropriate illustration.

In dealing with the design of coolers, heat interchangers, and similar plant (Chapter 7), the author rightly lays great stress on the turbulency factor. It is not commonly recognized that, with a given plant of this sort, the heat exchange is almost proportionate to the velocity within quite wide limits. A method is given for arriving at the size of heat interchangers and coolers; and though the writer cannot altogether follow the author in arriving at the number of tubes required to make up a surface of 274 sq. ft., it is found that the result is close to that of existing practice. In this, and in arriving at the size of coolers, a safety factor of 2 is employed. Is this justified? In the case of stills, coolers, and heat interchangers, there is every reason to believe that a definite capacity exists corresponding to a maximum efficiency. Is it possible to arrive at the correct design of plant if, after carefully calculating the size with regard to all known factors, one multiplies the result by 2 (or 3), in order to allow for contingencies? It is quite true, of course, that there are those who use plant of this description who vary the liquor throughput in a most irresponsible manner, and are quite pleased when a plant works well at twice the rated capacity. This simply proves that at the rated capacity the plant is not working efficiently. One can imagine a prospective buyer doubling the required capacity of a proposed plant to be on the safe side, unwitting of the fact that the maker of the plant employs a safety factor of 2.

Great importance is very properly attributed to the correct addition of lime, and the necessary plant for this purpose is described (Chapter 8). Although the high cost of caustic soda and soda ash (ammonia alkali) prohibits their use in most cases, the author in his comparison hardly does justice to the fact that the purity of the commercial forms of these alkalis is always higher than that of lime. Those who can obtain lime with 96 p.ct. CaO at 35s. per ton delivered, are lucky. The time contact required for lime is also higher than for the stronger alkalis, and it is possible that the liming section could be reduced and steam saved when these reagents are employed.

In Chapter 9 we return to the thermal aspect of the subject, with particular reference to sulphate of ammonia plants. Chapter 10 is devoted to methods of control, including special valves, and means for appreciating the flow of liquor. A reference to some good instrument for measuring steam would have been beneficial. Ideal conditions are laid down for the working of sulphate plants which stipulate a standard of 0·015 p.ct. of ammonia in the effluent liquor. This is presumably based on the cost of breeze at 12s. to 14s. per ton and a selling price of sulphate at £14 per ton. As these items are variable, the ammonia in the effluent liquor might be varied accordingly.

Having explained circumstances in which it pays to concentrate gas liquor before transit to the chemical manufacturer, the author deals in a clear manner with the process and plant required (Chapter 11). There follows an excellent account of the manufacture of concentrated liquor and liquor ammonia (Chapter 12). In view of the high heat of solution of ammonia, some mention might have been made of means for keeping the absorbers cool. The author later on gives the over-all efficiency on the ammonia basis of 93 p.ct. for liquor ammonia manufacture. The writer's experience was not so fortunate, as difficulty was experienced in showing 85 p.ct., although the process and plant were not identical with those here described.

The treatment of waste gases and effluent liquor is very informative, and these sections should be very useful to those who have trouble with either of these products. It must often be worth while to recover heat from the effluent liquor. A consideration of the possibilities of liquid purification using ammonia as the basis (Chapter 16) does not throw a favourable light on the proposition, as, apart from possible loss, the cost comes higher than that of dry purification. The production of ammonium carbonate is also dealt with (Chapter 17).

In putting forward schemes for the valuation of gas liquor (Chapter 18), a service of great value is rendered. The author anticipates criticism in one respect, and that is with reference to the chemical manufacturer's profit being based on a percentage of the cost of manufacture. The result is that not only does the chemical manufacturer fail to participate in any increase in the value of the product, but he would actually gain by increasing his costs. Clearly, if the two parties cannot agree to share the net profits, the manufacturer's return should be based on the selling price. With an interesting account of the ammonia soda process (which would preferably have been placed earlier in the book) the volume is concluded.

Generally speaking, the book is well enough written. Idiosyncracies, such as the equivalence of heat units and lbs. of steam, may be passed over; but exception must be taken to phrases like "the radiative power of products of combustion" (p. 73), and the legal term "and/or" (pp. 79, 222). There are more misprints and slips than a book of this sort should have—such as "gas liquor-devil liquor" (p. 69), "low low-water" (p. 138). Thomsen's "Thermo-Chemistry" (p. 86), Parramatta River, and catechol (p. 249), are misspelt. On p. 265 "velocity" referring to "2·9 c.ft.

* "The Design and Working of Ammonia Stills," by P. Parrish, A.I.C., M.I.Chem.E., pp. 300, figs. 170. London: Ernest Benn, Ltd.; price, 40s. net.

per second" should be "rate." On p. 140 the figure 1603 should be 1630, and in the footnote on p. 188, 1·5 should be 0·15. It is, however, in the chemical formulæ and equations that a great number of unfortunate and unnecessary faults occur. Formulæ in Table 10, equations on pp. 33, 53, 250, and 259 are incorrect. On p. 235, equation (4) is identical with equation (1), and in equation (3) H_2S appears on both sides. On p. 263 four equations out of a group of six are wrongly expressed.

It is doubtful if some of the tables are worthy of the name, and several appear with no indication of the data upon which they are based. Table 63 is confusing in the similarity of the horizontal and vertical headings. The large number of illustrations are almost all clear and well produced. Fig. 112 is inverted. Fig. 167 is supposed to represent four "views" of plant for the ammonia soda process. Apart from the difficulty of separating the views, two are merely unconnected geometrical figures of little value, in the third the reference figure "o" is not to be found, while the fourth view appears over-leaf as part of fig. 168.

There is one great omission which leaves the reader with a sense of incompleteness. Although the author evidently has the sulphate of ammonia plant at the back of his mind, and realizes that the still must have relation to the remainder of the plant, a stop is placed at the stillhead, and no account is given of saturators, centrifuges, and accessory plant. The time is very suitable for a treatment of this subject; and the author is particularly well qualified to deal with it. Objections to its inclusion should have been overruled.

The binding of the book is excellent; the printing leaves nothing to be desired; the paper is extra thick; nothing remains but to remove the advertisements from the end of the volume.

In general one may confidently say that the book will be carefully studied by plant and chemical manufacturers alike. Among the latter must be included the gas and coke-oven industries to whom the suggestiveness and candid opinions of the author will be specially valuable. In causing plant makers to review their designs, and in inducing chemical manufacturers to be very much more decisive in their demands and critical of their installations of plant, Mr. Parrish will have brought about a distinct advance in general economy of apparatus dealing with ammonia.

INTERNATIONAL COMMISSION ON ILLUMINATION.

Meeting at Geneva.

[FROM OUR SPECIAL CORRESPONDENT.]

(*Continued from p.* 642).

The second paper, which was presented by M. P. Fleury, gave an account of the work of the Comité Français de l'Eclairage and is summarized as follows.

RESEARCH TO ATTAIN A PRIMARY STANDARD OF LUMINOUS INTENSITY.

The author proposes to adopt a primary standard of luminous intensity based on the brilliance of a black body at a temperature T determined by the following conditions: Between two wave-lengths determining λ and λ_2, the radiation of the black body at T° is N times greater than the black body at the melting temperature of gold. The expression N (function of λ and λ_2) will be selected in such a way as to give the black standard the most favourable colour. The limits λ and λ_2 have been chosen with a view to obtaining the maximum state of precision.

M. Fleury stated in his introduction that, under the auspices of the French Committee, and directed by the invaluable counsels of his master (M. Henri Abraham, Professor of the Sorbonne, and Director of the Laboratory of the Ecole Normale Supérieure at Paris), he had experimented in his laboratory on achieving a primary standard of luminous intensity. The work was not completed, and the present communication only indicated the general plan and the preliminary results. He had followed the proposals of Violle in 1884, and adopted at that time by the International Electrical Commission. The first experiences showed the difficulties of the problems undertaken. Unfortunately, in the neighbourhood of 2000° to 2100° abs. (temperatures at which the colour of the illumination emitted is the same as that of the incandescent carbon filament lamps) the luminous brightness of the black body varies very rapidly with the temperature (about $\frac{1}{15}$ per °C.).

The author was confronted with the following considerations:

(*a*) The high-temperature furnace was composed essentially of a carbon tube, heated by the passage of an electric current. It was maintained for many hours at 2500° K. without undergoing alteration, and has continued at 2000° K. without deterioration. The current consumed was relatively weak—1200 watts at 2000° K.

(*b*) To maintain a constant temperature, the current consumed can be regulated with precision to near $\frac{1}{2000}$° K. In observing the variations on a suitable rheostat it is found that the variation of temperature of the furnace is less than 1° K. in half-an-hour. At about 2000° K. this constancy is easily controlled with a total radiation pyrometer; the electro-motive force being given with a potentiometer.

(*c*) As to the black body, in the axis of the heating tube was placed another tube of carbon separate from the first one and heated uniformly by radiation. The black body giving the measure of this was formed by the region of this tube situated between a solid diaphragm placed in its centre and another diaphragm in front of the first and pierced by a very small orifice.

(*d*) In regard to photometric measurement, the furnace was formed by parallel sheets faced with quartz. At the back of this was an achromatic lens which formed a true image of the opening of the black body. The brilliancy of this image was equal to that of the source, reduced by the absorption of the sheet of quartz and of the lens.

Comparing the luminous intensity of a portion determined by the image of the black body—limited by a diaphragm of a known surface—with that of different incandescent lamps, secondary standards were obtained by the Laboratoire Central d'Electricité. These measurements were made with a Lummer and Brodhun photometer. The comparison was to one ten-thousandth with a Carpentier potentiometer.

(*e*) To determine the temperature of the black body with the required precision, it was necessary to compare, with the aid of a spectrometer, the rays emitted between two wave lengths, and very carefully to work in the same region of a spectrum of another source.

PRIMARY STANDARD OF LIGHT PROPOSED BY THE NATIONAL ILLUMINATION COMMITTEE OF THE UNITED STATES.

Dr. Sharp, on behalf of the United States National Committee, read the following resolution:

"The U.S. National Committee of the International Commission on Illumination deems that it has been amply demonstrated that it is entirely practicable to realize a satisfactory primary standard of light by the utilization of the black body. Therefore the U.S. National Committee wishes to lay before the Commission for consideration the following resolutions:

"Resolved that the International Commission on Illumination recommends the international adoption as the primary standard of light of the brightness of a black body operated under conditions which are subject to accurate specification.

"Resolved that this Commission recommends to the National Laboratories that they take steps:

"1. To formulate standard specifications for the construction and operation of the black body as a primary standard of light.

"2. To fix upon a definitive figure for the brightness of such a body expressed in international candles per sq.cm."

After a discussion on this resolution, in which Dr. Sharp, M. Fabry, Mr. Buckley, Mr. Walsh, Dr. Crittenden, Mr. Paterson, and Prof. Vautier spoke, it was unanimously carried.

M. Fabry briefly reviewed the report on "Standards of Light suitable for Photographic Sensitometry" written by M. Jules Baillaud. This was discussed by Mr. Walsh, Dr. Crittenden, Mr. Paterson, M. Fabry, M. Bossu, and the President.

M. Blondin then summarized a paper "Douilles Spéciales de Lampes pour Essais Photométriques," prepared by M. Lebaupin.

Dr. Sharp having made some brief comments on this, the proceedings of Tuesday morning closed.

(*To be continued.*)

Progress of Gas in Japan.

According to figures quoted in the "American Gas Journal," there are at the present time 76 gas companies in Japan. The amount of gas used is double what it was in 1914, when there were only 10 companies in the entire Island Kingdom. There exist in Japan all the conditions making for the successful development of gas distribution; the population, which is larger than that of Great Britain, being to a very considerable extent urban. Japan has 66 cities, varying in size from Tokyo, with more than 2 million inhabitants, and Osaka, with 1¼ millions, down to Otsu, with something over 30,000. In all there are fourteen cities each containing more than 400,000 inhabitants. Gas is now used in the little Japanese homes for cooking and heating, in place of the charcoal brazier of earlier days. It is calculated that more than a million gas-lamps are in service in city streets; and there are in operation 2300 gas-engines, which drive machinery in factories of the largest to the smallest size.

Aluminium Paint.—The "Oil Chemical Review" states that the durability and protective power of aluminium paint is probably owing to the complete opacity to light and high reflectivity of aluminium, which reflects some 70 p.ct. of the visible spectrum, and about 90 p.ct. of the infra-red. Spar varnish, or heavy-bodied linseed oil with mineral spirits, makes an excellent vehicle for the aluminium powder. Aluminium paint is specially useful on furnaces, ovens, stacks, &c., where it is desired to radiate as little heat as possible; on light-oil storage tanks, where as little as practicable external heat should be absorbed; and on surfaces which are to be moisture-proofed. The objection to the use of aluminium paint on radiators because of its low emissivity is not serious, since most of the heating effect in this case results from air convection currents.

NOTTINGHAM GAS UNDERTAKING.

Jubilee Festivities.

In last week's "JOURNAL," p. 636, a brief historical sketch of the Nottingham Gas Undertaking was given. The following is an account of the social festivities held in connection with the jubilee of the acquisition of the undertaking by the Nottingham Corporation.

THE LUNCHEON.

Among the guests who accepted an invitation by the Gas Committee to luncheon on Aug. 14 were many who occupy distinguished places in the gas industry. Included in the company were several representatives of municipalities apart from Nottingham. Alderman Sir Albert Ball presided; there being also present in addition to the Deputy-Mayor of the City (Alderman E. L. Manning) and the Sheriff (Councillor A. Judd) Sir John Turney, who until his retirement was the doyen of the Corporation, with which he was associated when the undertaking was acquired; Alderman Sir Bernard S. Wright, Sir Arthur Duckham, Sir Henry Fowler, Chief Mechanical Engineer of the L.M.S. Railway; Mr. Arthur Hayday, M.P.; Sir Ernest Jardine, Chairman of the Trent Navigation Company; Sir Dennis Readett-Bayley, Managing Director of the Gelling Colliery Company, Notts., in connection with which important operations with low-temperature carbonization and the production of smokeless fuel are shortly to be inaugurated; Sir Thomas Shipstone; Mr. Milne Watson, Governor of the Gas Light and Coke Company; Mr. F. W. Goodenough, of the Gas Light and Coke Company; Mr. C. S. Shapley, of Leeds; Alderman G. Ratcliffe, Chairman of the Leeds Gas Committee and Lord Mayor Elect of that city; Alderman Fred West, Lord Mayor Elect of Manchester, whose firm installed the first vertical retorts in Nottingham; Mr. J. Ferguson Bell, of Derby, President of the Institution of Gas Engineers; Mr. T. Carmichael, Engineer to the Portsea Island Gas Company, formerly of Nottingham; Mr. F. W. Barnes, Engineer at Todmorden, also formerly of Nottingham; Mr. J. W. Broadhead, Managing Director, Robert Dempster and Sons, Ltd., Elland; Mr. E. G. Grimshaw, Secretary of the Calverley and Horsforth Gas Company, near Leeds; Mr. S. Tagg, Engineer to the Preston Gas Company, who was born at the Radford Gas-Works, where his father commenced work under the old proprietary Company 80 years ago; Mr. Charles Wood, Gas Engineer to the Bradford Corporation; Mr. W. B. M'Lusky, Halifax; Mr. H. Pooley, Leicester; Mr. John Wilkinson, Pudsey; Mr. George Stevenson, Long Eaton; and Mr. James Gibson, Mansfield. The company also included members of the Nottingham Gas Committee, and Mr. John Wilkinson, to whose conspicuously successful work as Engineer and Manager of the undertaking many eulogistic references were made; and other members of the Gas Department were Mr. T. Barnes (Commercial Assistant), Mr. R. H. Mason (Accountant), and Mr. W. Garton (Consulting Accountant), who joined the service of the old Company in 1856. It was to the great regret of the Committee that Mr. J. R. Clynes, M.P., leader of the House of Commons, and Mr. Will Thorne, M.P., both of whom have been prominently identified with organizing work in relation to the gas industry, were unable to accept invitations to be present.

After the Loyal Toast had been honoured,

Mr. J. FERGUSON BELL proposed "The Nottingham Corporation Gas Undertaking." After referring to many interesting details which had been embodied in an admirably prepared brochure relative to its history, he observed that Nottingham was known throughout the gas industry to possess well-equipped works which reflected much credit on those responsible for the control of so large and progressive a concern. When the undertaking was purchased by the Corporation in 1874, the gas made amounted in round figures to 650 million c.ft., whereas the output last year reached over 2600 million c.ft., or just 4 times. The receipts last year were £671,336, and the expenditure was £505,834, leaving a gross profit of £165,502. Since the transfer to the Corporation, the works had been greatly enlarged; and now the combined productive capacity of the three stations was approximately 100 million c.ft. per week. The area of the Nottingham gas supply was about 138 square miles, and the length of mains 431 miles, supplying in round figures 91,000 consumers. These figures gave some idea of the magnitude of the undertaking; and he ventured to predict that, great as the progress had been during the last fifty years, provided the same progressive policy were continued in the future, their business of supplying gas would occupy an even more important position than it did at present. Though he was a firm believer in private enterprise, yet he heartily congratulated the citizens of Nottingham on the splendid results obtained by the wise administration of their gas undertaking. He might perhaps remind them that the continued success of their undertaking meant remunerative employment to a large number of men. He was informed that there were in all some 850 employees, whose wages and salaries last year amounted to £133,359. This was not all, for in addition the gas estate paid in rates £33,466. There were 44 weekly wages employees in receipt of pensions, in consideration of long and faithful service. The visit that morning to the Radford and Basford Works had been interesting and instructive. The plant installed indicated that progress had been upon scientific lines, both as regards mechanical handling, carbonization, and the efficient production of gas and the bye-products which now played so important a part in many allied industries. He looked forward with confidence to the future of the gas industry. Industry required not only cheap power, but more efficient utilization of heat energy, so that the appalling waste of the national fuel reserves might be materially reduced, and costs of production lessened. The burning of raw coal was not only wasteful, but the production of smoke and soot polluted the atmosphere, thus causing great financial loss and impaired health. The time was coming when, instead of burning raw coal, they would insist on the use of gaseous or smokeless fuel. The immense and varied past, the present service, and the future possibilities of gaseous fuel indicated that the gas industry had a great future before it; and he felt sure that the city of Nottingham would be in the van of progress. He coupled with the toast the name of their esteemed Chairman, Sir Albert Ball, who would long be remembered for the notable part which he had taken in municipal affairs. Sir Albert had been Chairman of the Gas Committee for 17 years, and his tenure of office had been coincident with the era of the undertaking's greatest expansion. His energy, resource, and business aptitude well qualified him for the position; and the Council were fortunate in being able to enlist the services of so able a man. He was sure it was the wish of all present that Sir Albert might long be spared to preside over the Gas Department, assisted and supported by a very able Committee whose only desire was to administer well and wisely the trust committed to their charge. Their capable and zealous Engineer and General Manager, Mr. Wilkinson, had won esteem and confidence as a wise and sagacious adviser. The works which they had had the opportunity of inspecting that day were a monument to Mr. Wilkinson's engineering ability and sound judgment. Mr. Wilkinson was, at the last annual general meeting of the Institution of Gas Engineers, elected Junior Vice-President, which indicated that he also stood high in the estimation of his colleagues. (Applause.)

Sir ALBERT BALL, in reply, expressed his appreciation of the cordiality with which the toast had been received. The undertaking had experienced a long era of prosperity; and the municipality owed much to those who had sufficient wisdom to undertake its purchase, including in this connection Sir John Turney, whom it afforded them the greatest pleasure to welcome among them that day. After mentioning several historical facts of interest, Sir Albert referred to the circumstance that, when the Corporation acquired the gas undertaking, the amount of gas unaccounted-for was represented by 11·8 p.ct., whereas to-day the leakage was only 3·69, which he thought would compare favourably with that of any similar undertaking in the country. The fact that the total accumulated funds of the concern nearly equalled the capital was, he suggested, unique in the history of gas undertakings. During the period of Corporation control, £1,189,752 had been allocated from profits in relief of rates, and during the whole of the time the prices charged for gas had compared very favourably with those in most large cities of similar character. Last year the gross income from bye-products was a record—£230,235. They were told from time to time that the gas industry was a dying industry. But let them not believe it. It was only just beginning to grow. With loyal support from the Committee, officials, and workmen, backed up by honesty of purpose, he was satisfied that the undertaking had as great a future before it as it had had a glorious past. There was without doubt plenty of room for both gas and electricity. Great things were being anticipated from low-temperature carbonization of coal, the expectation entertained being that, if it did not make an altogether smokeless city, it would go far towards abating the smoke nuisance. The work was to be undertaken on a large scale at one of the local collieries; and if those responsible for it could supply Nottingham with some gas at less cost than the Corporation could produce it, and also provide good fuel for the citizens, those responsible for the administration of the Nottingham gas undertaking would try to work with them and take some of their gas. But unless the promoters of the scheme could give them some advantage, they would have nothing to do with it. Sir Albert Ball paid a cordial tribute to Mr. John Wilkinson, whom he described as one who thoroughly understood his business, and who was recognized by everybody as a man who was at the head of his profession. The undertaking had also the advantages of the services of an excellent accountant in Mr. Mason.

Alderman G. RATCLIFFE, Chairman of the Leeds Corporation Gas Committee, proposed "The City and Trade of Nottingham," and paid a high compliment to the municipality upon the efficiency of its gas undertaking.

The toast was acknowledged by the DEPUTY MAYOR (Alderman E. L. Manning), the SHERIFF of the CITY (Councillor A. Judd), and Alderman Sir BERNARD S. WRIGHT.

The toast of "The Visitors" was given by Alderman H. BOWLES, and acknowledged by Sir JOHN TURNEY and Alderman FRED WEST. The health of the Chairman, proposed by the DEPUTY MAYOR, was accorded musical honours.

WORKERS' CO-OPERATION.

The comradeship which obtains among all sections of workers in the various departments of the Committee's activities was exemplified at the evening dinners to which they were entertained; there being four such assemblies in all, beginning on Thursday evening. The company upon each occasion gathered at the Exchange Hall.

At the first of these functions, at which Sir ALBERT BALL presided, supported by members of the Gas Committee, Mr. Arthur Hayday, M.P., and others, attention was fittingly directed by the DEPUTY MAYOR, when proposing the principal toast, to the happy thought which prompted the Chairman and his colleagues in the administrative control of the undertaking to bring together in the home of municipal activity those who were associated with the City's chief trading undertaking.

Mr. J. WILKINSON, regard for whom by the workers was evidenced by the heartiness of the reception accorded to him, in replying to the toast of "Success to the Nottingham Gas Undertaking," typified this branch of municipal enterprise as depending for its success upon the same cohesion of effort as was necessary in the case of a four-oared boat, in which success could only be attained by each man pulling his weight. It was essential that there should be thorough co-operation in all departments of the gas industry, if adequate results were to be achieved. Wonderful progress had been made; and, despite the competition of electricity, he was optimistic enough to believe that the

gas undertaking in Nottingham would continue to maintain its high reputation and efficiency. [Applause.]

Mr. H. THORNELOE, of the Distribution Department, also spoke in response to the toast, emphasizing the friendly relationship which existed between the Committee and the employees.

Mr. ARTHUR HAYDAY, M.P., in proposing the toast of "The Chairman," observed that no man more zealously guarded the interests of this important branch of municipal service than did Sir Albert Ball. He and the Committee over which he presided had the control of an undertaking of great financial value. Mr. Hayday, after referring to the circumstance that this year marked the jubilee of the formation of the first Gas Workers' Union, alluded to the encouraging fact that during the fifty years of municipal control of the gas undertaking in Nottingham there had never been a strike. Few, if any, industries could make such a claim.

Sir ALBERT BALL, in reply, expressed the pleasure which it had afforded the members of the Gas Committee and himself to entertain the employees of the undertaking. The Committee realized that they had a body of excellent workmen; but while they were desirous of satisfying the employees, they had also to study the interests of the ratepayers. The Committee preferred collective bargaining because they believed it was the best method for all concerned. He invited the continued loyalty of all connected with the undertaking.

At the dinner given on the Friday evening to another section of the administrative staff and manual workers, several members of the Gas Committee were again present.

Mr. A. PARKES (the Vice-Chairman) in proposing "Success to the Gas Undertaking," referred to the great indebtedness of the Municipality to the Chairman, Sir Albert Ball, whose business capacity he characterized as second to none. All members of the Committee were delighted to afford him their most complete assistance. Alluding to the encouraging fact that during the past 50 years there had been no strike of workmen engaged with the undertaking, Mr. Parkes emphasized the need for harmony, commonsense, and the exercise of a conciliatory feeling between employers and employed. The ratepayers owed a deep debt of gratitude to Mr. John Wilkinson, the Gas Engineer, for his successful management of the undertaking, which had enabled substantial financial results to be reaped for the benefit of the Municipality. With a continuance of practical interest on the part of all concerned, there was reason for anticipating an even larger measure of success in the future.

Mr. T. BARNES (Chief Commercial Assistant) who entered the service of the old Gas Company in 1869—five years before the acquisition of the undertaking by the Corporation, for which he has since performed consistently sound work—responded to the toast, observing that the jubilee commemoration marked a record of continuous progress and development. He had every confidence in regard to the future success of the undertaking. The significant factor in relation to the progress which had been achieved during 50 years of municipal control was that every man in his day and generation had rendered unfailingly effective service. [Applause.]

Mr. C. ELLIOTT, who is engaged at the Basford Works, and has 23 years' service to his credit, also acknowledged the toast in epigrammatic sentences. There were three things that had always been impressed upon him: Do as much as you can. Do as well as you can. Say as little as you can while doing it.

An enthusiastic reception was accorded to the toast of "The Chairman," proposed by Mr. G. H. JAMES, who said that Sir Albert Ball had rendered service of inestimable value to the Municipality. It was a source of special gratification that he had upon all occasions manifested the greatest solicitude for those who were in the Corporation's service.

Sir ALBERT BALL, responding, claimed that the undertaking was one of which the city had just reason to be proud. They possessed a staff of employees which compared most favourably with that of any similar undertaking in the country. He appealed to them all to continue to do their best, feeling confident that their loyal support would be forthcoming to render work in the future even more successful than it had been in the past. [Applause.]

Upon the occasion of the several gatherings, the pleasure of those assembled was considerably enhanced by admirably rendered programmes of instrumental and vocal music, the proceedings throughout being significant of the complete accord existing between the Committee and all sections of the workers.

The Centigrade Thermometer.—"Industrial and Engineering Chemistry" quotes the following remarks made by Mr. Charles S. Palmer with reference to the origin of the Centigrade thermometer: The reading of a good bibliography of a great scientist is at all times a good mental stimulus and a fine moral tonic; and the life of Linnaeus, the great Swedish naturalist—a name worthy to be quoted with Aristotle or Darwin—is such a book. The edition edited by Benjamin Daydon Jackson Witherby (London, 1923), states that it was Linnaeus who first used the Centigrade scale. He published an illustration of a thermometer with 0 at freezing and 100 at boiling point of water, in his "Hortus Clifortianus," Holland, 1738; while Celsius, who appears to have first published his thermometer in 1742, seems to have put 0 at the boiling point of water and 100 at the freezing point. Celsius was a great Swedish mathematician and astronomer, and apparently there is a chance for some young enthusiast to work out the many curious points involved in the actual adoption of the scale which we call "Centigrade." Just how the ascending order of Linnaeus happened to be adopted in scientific circles under the name of Celsius—who seems to have used the reverse order—is another of those interesting historical anomalies that add to the gaiety of the nations and help to make life interesting. Probably most of us use the term "Centigrade," but it would be helpful to know just how far either Linnaeus or Celsius, or both, helped in giving us a rationally constructed heat measure.

THE POSITION OF THE GAS INDUSTRY IN IRELAND—1924.

By T. J. REID, of Ballina.

The text of the paper read by Mr. Reid before the Irish Association of Gas Managers at their annual meeting on Aug. 13 was given in last week's "JOURNAL" (p. 647).

Discussion.

The PRESIDENT (Mr. W. E. Young, of Queenstown) said they had listened with great interest and much benefit to the paper by Mr. Reid. He had dealt with an important subject in a masterly fashion. With reference to one portion of the author's remarks, he (the speaker) thought they were all conscious that the cost of stoves was higher than it should be. It would be well if the makers could cut out some of the refinements; for what was wanted in Ireland, above all things, was something cheaper. They were up against electricity every day in the week, and even people of experience found a difficulty in knowing exactly where they were. He had seen a paragraph in a technical paper from which it appeared that a correspondent, on testing a half-watt lamp, had found that it took anything from 0·7 to 1 watt. No doubt there was a good deal to be said for advertising, and it would be well for members to consider how this could best be done.

Mr. R. BRUCE ANDERSON (London) remarked that Mr. Reid had talked of having a representative Association. It was very desirable nowadays that they should be able to present a united front. They had to come in contact with Government Departments, who were naturally more ready to listen to those who had authority to speak for the industry than to those representing individual undertakings. Managers who were not already members of the Association should be urged to join it, so that the organization might be able to claim to represent as far as possible the entire gas industry of Ireland—both South and North. In connection with this matter, it would also be of advantage for all the members to join the National Gas Council, which was formed to protect the industry generally, and had done yeoman service. As they were doubtless well aware, the Council were instrumental in getting passed the Gas Regulation Act, which was so valuable a charter for the gas industry. Most of the gas undertakings in Ireland were very small, and the subscription to the National Council would be only a guinea, which was the minimum amount. This covered the contributions to the Institution of Gas Engineers and to the British Commercial Gas Association; and it was highly desirable that the entire gas industry of the country should actively support all three bodies. Members could get from the British Commercial Gas Association and the National Gas Council admirably prepared literature on all kinds of subjects, as well as the assistance of experts in solving any particular problems that might crop up. As to electrical competition, he had had experience of this in a good many places. One of the first was in Queenstown, where, in spite of this competition, the demand for gas had been going ahead rapidly. He attributed this largely to the introduction of electricity having set a higher standard of lighting, up to which everybody found it necessary to live. Of course, apart from this there had also to be taken into account the spread of the use of gas for cooking. He was fully in agreement with the author's contention that if they had cheaper cookers they would be able to do more with them. The oil cookers with which they were in competition were not the heavy things that gas-cookers were. He felt they could well do with something of a lighter character, which could be scrapped when some improved type came along, instead of the more solid apparatus which cost so much that it had to be kept in use for many years. It was difficult to get the consumer to pay the charge which the cost of the present style of cooker necessitated.

Mr. H. W. SAVILLE (Wexford), touching upon the point of cheaper cookers, informed the meeting that at one time, when circumstances were different, he obtained a fair quantity of a cheap line of cookers. Some half-a-dozen were taken by consumers, but he had been unable to get any more on to the district, and had them still. People could not be induced to look at them. That was his experience. His own feelings with regard to the future of gas in Ireland were quite optimistic. For one thing, he doubted very much whether the money would be forthcoming for the Shannon electrical scheme. Through all their troubles in Wexford, they had never once looked back, but had gone on increasing their output. He was not afraid of putting his own money into the gas undertaking, or of advising other people to do the same.

Mr. P. J. M'EVOY (Midleton) thought all of them would go away with the idea that what was wanted in Ireland was more enthusiasm. The gas managers there were too apathetic. To his mind it was important that gas people should endeavour to retain the public lighting. This, indeed, should be the show window of the gas-works; they should concentrate on it, with a view to letting the public see what they could do. With the great improvements that had been effected in gas burners and lamps, he firmly believed that this method of illumination could hold its own with anything the electricians could produce. He agreed that the cost of cookers was at present prohibitive. At Midleton, which was a small undertaking, the Directors were not afraid to sink capital, and had decided to put in as many slot installations as they could. The cost was about £10 a house with the cheapest cookers that were supplied. Every effort must be made to supply really good gas at a reasonable price, and then there would be little need to fear electrical competition.

Mr. H. KIRKHAM (New Ross) said that the supply of electricity as well as gas had been practically forced upon him. Hearing that there was likely to be competition, he had taken the matter of supplying electricity into his own hands, with good results. He believed that stoves could be supplied more cheaply, and that it would be to the interest of manufacturers to try to reduce prices and secure a bigger output. He believed the cause of some gas companies being in a bad way was that the Directors did not always sufficiently back up their officials. But he had no fear whatever for the gas industry. Its

salvation would come from the cooking, heating, and power load; for lighting, he thought the use of electricity would continue to increase.

Mr. REID said that Mr. Kirkham had told them that he had been practically forced into the position of undertaking the dual supply of gas and electricity, with resultant benefit to the Company; but were the people of New Ross getting any better service now than they would have had if gas had remained in sole possession of the field? This question was of importance to other towns which might be thinking of adopting electricity in conjunction with gas or without it.

Mr. KIRKHAM replied that people were getting satisfaction. The trouble was that people would not properly look after their incandescent gas-fittings; and electric lamps did not require the same amount of attention. If gas burners and mantles could be kept in good order, one got better results from gas at a lower price; but everybody would not do this.

The PRESIDENT: What about the relative costs of production and charge for the two commodities? That would be a guide for other people who might contemplate similar procedure.

Mr. KIRKHAM answered that it would be rather difficult, as he was placed, to go into the matter of cost, but he was strongly of opinion that, if there was to be an electricity supply, the gas undertaking should be able to give it. He had a suction gas producer, using coke; and allowing for depreciation, the electricity portion of the undertaking was paying much better than the gas. The selling price was 1s. 2d. per unit for lighting, and gas was 10s. per 1000 c.ft.

Mr. L. G. YOUNG (Carlow) spoke of early experience of electricity in his town, with a water power scheme. This was subsequently abandoned, and a system for generating current in the town superseded it. In the case of the Shannon scheme, he thought the cost of transmission would absorb all the profit that might otherwise accrue from it. In Carlow there had been suggestions for the amalgamation of the two undertakings, but the Gas Company had so far declined to entertain the idea. When people desired electricity, the cost did not seem to enter into the matter; it was simply a question of convenience and the desire for being what was regarded as up-to-date. The charge was 1s. per unit, less 10 p.ct.; and the price of gas was 5s. 8d. per 1000 c.ft.

Mr. D. A. PRATT (Messrs. Firth Blakeley, Son, & Co.) remarked that a number of gas companies had gone out of existence or lost their lighting contracts purely through apathy; and the conclusion he had come to was that, if the Shannon scheme did no more than wake up the gas managers to the facts of the case, it would not have been in vain. He drew attention to what had been done at Scarborough, where the Gas Manager (Mr. A. P. Allen) had asked: "If I put you up on the front a light infinitely better than electricity, and cheaper, will you give me the contract?" The reply had been in the affirmative, and he had put up one at his Company's expense. Now the whole front was magnificently lighted by gas. Having himself had the control of two small works, he was firmly of opinion that, if the facts were fairly faced by the gas managers, there was no fear of electricity cutting them out.

Mr. J. M'NICHOLL (Cork) thought the paper was very encouraging to them, as coming from one who had evidently closely studied the gas industry in Ireland. The cheaper cooker was a long time in coming, but he hoped they would have it eventually. Mention was made in the paper of vertical retorts for small works. It was difficult to decide whether in such works it would be more advantageous to introduce mechanical stoking machinery or verticals. Personally, he was beginning to think that it might pay to instal a modified system of vertical retorts, and he hoped the future would see the makers of them catering for the smaller works. It seemed to him that the cost of distribution was what would wreck the Shannon scheme; this cost in Ireland must be enormous.

Mr. G. W. NORMAN (Dublin) also gave figures to show the unpromising nature of the Shannon electricity scheme from a financial point of view.

Mr. L. W. DALBY (Wicklow) gave particulars of the electricity scheme in his town. This had been in operation for some eighteen months; and when they came to balance accounts, it was found that interest and sinking fund charges could not be met, and a two years' moratorium was obtained. The advent of electricity had made people realize that there was a gas-works in the town, and he was getting entirely new inquiries for gas fires, boilers, irons, &c., which was very encouraging. There was, of course, a class of consumer who would rather pay three times as much for electricity as for gas, to avoid cleaning the burners every now and then.

Mr. REID, in the course of his reply to the discussion, said the remarks showed that gas could in most instances perform service better and more cheaply than electricity. This, of course, they themselves knew; but what they needed to do, if they could, was to make it known to the public. The general Press showed extraordinary ignorance on gas matters. It was up to them, as the guardians of the gas industry in Ireland, to make their voice heard. He quite agreed that public lighting should not be allowed to go by the board, but that it should be regarded as the shop window of the gas undertaking. He was fitting a lamp with three No. 2 Sugg burners, supplying the equipment and the gas, and lighting and extinguishing, for £3 per annum. This could not pay, but it was well worth while as an advertisement. He took it the opinion of the meeting was that they should not be unduly pessimistic with regard to the future. Gas could give a better light at a cheaper rate than electricity; but, as he had said in his paper, it was very difficult to give actual figures of cost in cases of this sort. He thought in time to come they would be able to have small vertical retort plants which would give them the essential benefits which such a system offered. In conclusion, he would like to see some definite steps taken to make the Association of the greatest possible use, and to make it in reality what it was in name—the Irish Association of Gas Managers.

The late Mr. Frederick William Berk, of Messrs. F. W. Berk and Co., manufacturing chemists, of Fenchurch Avenue, E.C., left estate of the gross value of £79,067, with net personalty £75,214.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

Northern Ireland—Education Scheme.

SIR,—Will you kindly inform your readers that the Government of Northern Ireland have now approved the Education Scheme of the Institution of Gas Engineers.

Candidates there desiring to sit for the Examinations of 1925 must send their names to me or to the Organizing Secretary, Mr. Walter Hole, Dentdale, Barton, Torquay, before the 31st inst.

WALTER T. DUNN,
Secretary.

Institution of Gas Engineers,
28, Grosvenor Gardens, Westminster, S.W. 1.,
Aug. 21, 1924.

The Prospective Lord Mayor of Manchester.

SIR,—Those connected in any way with the gas industry would read with pleasure your Editorial Notes in last week's "JOURNAL" on the proposed signal honour to be conferred on Alderman F. J. West, C.B.E., by his election to the distinguished position of Lord Mayor of Manchester for the coming municipal year.

This distinction honours Alderman West and the industry with which he is prominently connected, and in which he takes a very real interest especially on the technical side.

No doubt the accompanying letters will be of interest to your readers, who, I feel sure, desire that he and Mrs. West may have a very happy and successful year.

J. FERGUSON BELL.

Derby, Aug. 22, 1924.

Aug. 18, 1924.

DEAR ALDERMAN WEST,—I should like, on behalf of the gas industry, to offer you our hearty congratulations upon your nomination for the important and honourable position as Lord Mayor Elect for the City of Manchester.

I am quite sure you will discharge the multifarious and responsible duties in a manner that will add lustre to, and worthily maintain the best traditions of, the Mayoralty. In this you will be ably seconded by your good wife and members of your family, and I wish you all every happiness and a very successful year of office.

The name of West is an honoured one in the gas industry. It is therefore all the more pleasing that you will, all being well, next November become the Chief Citizen of the great city of Manchester.

It affords me the greatest possible pleasure to offer you our congratulations and good wishes.—Believe me, Yours very truly,

(Signed) J. FERGUSON BELL,
President, Institution of Gas Engineers.

Aug. 21, 1924.

DEAR SIR,—I duly received your very kind letter of the 18th inst., and very much appreciate your hearty congratulations and good wishes expressed on behalf of the gas industry, and in the name of the President of the Institution of Gas Engineers, on my accepting nomination for the Lord Mayoralty of Manchester.

I can assure you that both my wife and myself feel that the good wishes you so kindly express will be a very great help and encouragement in the responsible duties which will fall to our lot during the ensuing year.

With renewed thanks and kindest regards,—Believe me,

Yours sincerely,
(Signed) F. J. WEST.

On Thermal and Chemical Balance-Sheets.

SIR,—I must thank "Careful Reader" for calling my attention to certain arithmetical slips in my paper on heat balances. Actually I have found two others. In the table at the bottom of p. 583, col. 1, for 16·0 should be read 16·0 × 2, and for 14·01 should be read 14·01 × 2. I plead the excuse that the substance of the paper was the outlining of a scheme for the compilation of heat balances; and as the conclusions were in no way concerned with the accuracy of the arithmetic, it escaped rechecking.

The method employed by "Careful Reader" might be used as a means of estimating the sensible heat of solid or liquid material, but it is in no way applicable to the estimation of the sensible heat of the vapour of hydrocarbon. However, it must be admitted that a certain amount of tarry matter is always carried in foul gas, even at a high temperature, as liquid. Only direct experiment will throw light on this problem.

M. W. TRAVERS.

147, *Queen Victoria Street, E.C. 4.*
Aug. 22, 1924.

Morpeth Gas Light Company (1902) Ltd.—The annual report and balance-sheet for the year ended June 30 were submitted yesterday. The gross profit for the year amounts to £2875, which, with £785 brought forward, gives an available sum of £3661. The Directors recommend that this be dealt with as follows: In writing off for depreciations on meters and cookers, £100; in placing to special reserve, £350; in placing to general reserve, £150; income-tax and corporation profits tax, £800; in paying 5 p.ct. (less income-tax) for the year on the preference shares, £542; in paying 6 p.ct. (free from income-tax) on the ordinary shares, £924; and in carrying forward a balance of £793. The output of gas has increased by 2 million c.ft.

MISCELLANEOUS NEWS.

GLASGOW CORPORATION GAS DEPARTMENT REPORT.

The fifty-fifth annual report of the Glasgow Corporation Gas Undertaking, which embraces the year from June 1, 1923, to May 31, 1924, states that the gross revenue amounted to £2,220,250, and the gross expenditure to £1,526,882, to which is added £152,766 for depreciation written off capital assets. The balance carried to profit and loss account is thus £540,602, which compares with £592,006 for the previous year.

The Committee had to meet the following requirements during the year: Annuities on stocks, £18,504; interest on borrowed money, &c., £114,119; and sinking fund, £122,800—leaving a surplus on the year's operations of £285,179, as compared with £334,502 for 1922-23. The rate of interest payable to the Corporation loans fund in respect of money borrowed was at the rate of £4 11s. 8d. p.ct., as compared with £4 15s. 6d. p.ct. for the preceding year. The Committee applied £3935 of the amount at the credit of the sinking fund to the extinction of £862 10s. of 9 p.ct. and £1640 of 6⅔ p.ct. gas annuity stocks; and the annuities formerly payable upon these stocks now cease to be a charge upon the revenue of the Department. There has also been redeemed during the year, by the application of moneys at the credit of the same fund, a further amount of £150,000 of loans raised under the Glasgow Gas Act, 1910, section 47, and the Glasgow Corporation Order Confirmation Act, 1921, section 5. The amount contributed to sinking fund for redemption of annuities and loans was £122,800, to which is added £1503, being the accumulations of the unappropriated portion of the sinking fund, making a total addition to the fund of £124,303 during the year. The sinking fund, with its accumulations, now stands at £1,978,550, of which there has been applied in the redemption of borrowed money and annuities £1,974,431, leaving still available for either of those purposes the sum of £4118.

The quantity of coal carbonized during the year was 691,933 tons, as compared with 693,372 tons for the preceding year, a decrease of 1439 tons. The average cost of coal carbonized last year was 23s. 4·011d., being an increase of 1s. 8·313d. over the preceding year. The quantity of coal gas made per ton of coal carbonized was 13,249 c.ft., which, with water gas, gave an average of 13 594 c.ft., as compared with 12,753 c ft. and 13 280 c.ft. respectively per ton for the previous year. The gas delivered and accounted for during the year amounted to 8,517,531,811 c.ft., as compared with 8,202,917,044 c.ft. for the preceding year—an increase of 314,614,767 c.ft., equal to 3·835 p.ct. The unaccounted-for gas was 9·45 p.ct., as compared with 10·918 p.ct. for the preceding year, a decrease of 1·468 p.ct. The greatest quantity of gas sent out in 24 hours was 38,648,000 c.ft., and the maximum daily make was 38,887,000 c.ft.

The net sum realized from the sale of coke amounted to £358,545, being £111,124 13s. 11d. more than that of the preceding year. The total quantity of coke sold was 342,949 tons, compared with 358,846 tons, a decrease of 15,897 tons.

The number of ordinary meters in use on May 31 last was 193,548, as compared with 193,848 a year ago, a decrease of 300; and the number of prepayment meters in use on May 31 was 107,552, as compared with 106,257, an increase of 1295—giving a net increase of 995 meters. During the year 27,669 meters were repaired at the workshops. The number of cooking and heating appliances on hire at May 31 was 293,594, as compared with 265,991 a year ago.

PORTSEA ISLAND GAS LIGHT COMPANY.

The Half-Yearly Meeting of the Company, which was held at the offices in Portsmouth on Tuesday of last week, was presided over by Mr. T. H. F. LAPTHORN, J.P.

The CHAIRMAN, having briefly referred to the death of Mr. F. M. Aylen, after 28 years' service as a member of the Board of Directors, and to the election of Mr. W. Doig Gibb, O.B.E., M.Inst.C.E., in his stead, went on to say that the receipts from the sale of gas to private consumers had increased by £3111. Speaking in therms, they had sold 5,021,154, an increase over the corresponding six months of 470,624—a percentage increase of 10·34. In the seven weeks which had elapsed during the current half-year they were still keeping up their increase; the percentage for that period being a little over 8. The increased consumption was explained by the fact that there were more consumers, and more appliances in use. The cookers in use numbered 40,877, an increase of 1914; and the fires 15,560, an increase of 6424. Orders for the latter were still coming in. There were 1420 radiators in use, an increase of 319; and the sales of geysers and washboilers numbered 734. None of the figures included the appliances bought by the customers direct from ironmongers and builders' merchants. Rental for meters and hire of appliances was up by £2483, and receipts from residuals showed an increase of £5000. Expenditure on coal and oil had increased by £7020. They anticipated that the cost would be more in the current half-year, mainly due to the fact that during the last six months they had been drawing very largely on old stocks, which they had been able to buy at a lower price. The net cost of coal and oil was more by £2001. Distribution expenses were up by £4710, but over £2000 of this arose from an increased allowance for the depreciation of fires and cookers. The Company's contribution for National Health Insurance amounted to £378, and for Unemployment Insurance to £744. Under the pension fund they paid for the men, as the Company's contribution, £713, and for the staff £573. The total amount found by the Company for this purpose was £2079. The new plant was well in hand, and, when completed, would give an additional output of at least 1½ million c.ft. per day. It was anticipated that the plant would be ready for use by the winter of next year. Concluding, he said he was glad to be able to report that the work was proceeding smoothly. They had had no difficulties or friction with any of the staff, and he would like to tender to all of them, from the top to the bottom, the thanks of the Directors and shareholders for the way in which they had co-operated to produce a good article, and make the Company a successful and prosperous concern. He moved the adoption of the report and accounts.

Mr. A. W. OKE seconded, remarking that the report was a most satisfactory one, considering the great difficulties with which the Company had had to contend. Speaking as an old shareholder, he looked upon the concern as one of the best investments in the South of England. He suggested that the Directors might offer the shareholders a number of preference shares.

The CHAIRMAN promised to place the suggestion before the Board, and the report and accounts were adopted.

The Directors recommended donations of £100 and £10 10s. to the Royal Portsmouth Hospital and the Portsmouth and Southern Counties Eye and Ear Hospital respectively; also the distribution during the ensuing winter of 100 tons of coke among the poor residents within the limits of the Company's supply. These recommendations were agreed to.

TRADE NOTES.

Sadler-Cockey Reversing Centre Valve.

A Sadler-Cockey reversing centre valve has been fitted to the purifiers at the Treforest Gas-Works of the Pontypridd Urban District Council by Messrs. Edward Cockey & Sons, of Frome.

Contracts for Water-Softening Plants.

The Becco Engineering and Chemical Company, Ltd., of London, have received two more repeat orders from the Gas Light and Coke Company. These are for water-softening plants; one of a capacity of 480,000 gallons per day, for the Beckton Works, the other of a capacity of 108,000 gallons per day, for the Nine Elms Works.

"K.-B." Laundry Equipment.

A booklet newly issued by the James Keith and Blackman Company, Ltd., of No. 27, Farringdon Avenue, London, E.C., gives full illustrated particulars of their extensive laundry equipment, which includes drying plants of various kinds, fans for ventilation, steam removal, and induced draught, irons, and high-pressure lighting.

Yokohama Gas-Works Contract.

The Power-Gas Corporation, Ltd., of Stockton-on-Tees, have secured the contract from the Yokohama Gas-Works for a coal-gas retort generator plant with direct bye-product recovery. The initial plant will have a capacity of 1 million c.ft. per day, and will be laid out suitable for extension to 3 million c.ft. per day. The plant comprises two generators with mechanical fuel feed and mechanical coke-extractor gear, waste-heat boiler, ammonia scrubber, gas washer, blowers, circulating pumps, &c.

"Lopulco" Pulverized Fuel Equipments.

The fifth large order for "Lopulco" plant which has been placed within a few months in this country has been secured by Vickers and International Combustion Engineering, Ltd., of Africa House, Kingsway, London, W.C., and is for a complete pulverized fuel installation for the power station of the County Borough of Derby. The contract has been accepted on strict efficiency guarantees for fuels of variable calorific values. The plant will consist of two Babcock and Wilcox water-tube boilers to give steam at 300 lbs. per sq. in. superheated to 750° Fahr., each boiler having a patent "Lopulco" combustion chamber with patent water screen and passages inside the walls for preheating air; one dryer of improved "Lopulco" type, which will reduce the moisture in the fuels to about 5 p.ct.; two Raymond roller pulverizers, each having six rollers to grind the fuel to such fineness that 90 p.ct. will pass through a 100-mesh sieve; two groups of "Lopulco" feeders for delivering the pulverized fuel to the burners; and ten "Lopulco" burners of the flat-flame type, with primary air ports, designed to rest on the suspended arches of the combustion chambers.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Aug. 20.]

Nos. 18,986 to 19,503.

ALDRIDGE & RANKEN, LTD.—"Means for connecting mouthpieces and stand-pipes of gas-retorts." No. 19,252.

ALLENDER, J. J.—"Gas fires or stoves." No. 19,455.

BEAVEN, T. A.—See Aldridge & Ranken, Ltd. No. 19,252.

BETHLEHEM STEEL COMPANY.—"Meters, &c." No. 19,158.

CANNING, T. F.—"Stoking machine." No. 19,429.

CLARK, R. G.—See Canning, T. F. No. 19,429.

COOKE, A. G.—"Dry gas-meters." No. 19,304.

DRAKE, J. W., and DRAKES, LTD.—"Mechanism for discharging contents from gas-retorts." No. 19,088.

DUFLOT, L. and R.—"Burners for heating." No. 19,157.

GIBSON, R. K.—"Indicating attachment for meters." No. 19,196.

HUDSON, G. C., and J. J. C.—"Geysers, &c." No. 19,041.

LANDIS & GYR SOC. ANON.—"Prepayment meters." No. 19,418.

OAKLEY, P.—See Allender, J. J. No. 19,455.

PHILLIPS, B. C.—See Cooke, A. G. No. 19,304.

POTTERTON, T.—"Gas-heated boilers." No. 19,311.

RICHARDSON, W.—See Allender, J. J. No. 19,455.

SYNTHETIC AMMONIA & NITRATES, LTD.—"High-pressure joints." No. 19,446.

SYNTHETIC AMMONIA & NITRATES, LTD.—"Gas purification." No. 19,447.

WARD, C. W.—"Apparatus for washing and/or separating coke from clinker." No. 19,006.

NORTH-EAST COAST COAL TRADE.

From our Own Correspondent.

Up to the present the recent international agreement reached at London has naturally not had any actual effect in the coal trade. Indeed, in spite of widespread press reports of an improved tone, it is very difficult for anyone actually on the market to find any change. Optimism there almost always is, among certain people who have coal to sell, that something will turn up to improve matters when things are bad. Yet, while reports were being published early this week in many quarters that things were beginning to look up, a contract was fixed up for gas coals for the rest of the year at 17s. 9d. f.o.b.! This is a price, of course, at which very few collieries could possibly afford to work; but it is a clear indication of the actual state of the market—a contract at this price when matters are supposed to be improving.

It is true that there is a certain amount of inquiry coming in, but competition is exceedingly keen for any actual orders that are available. So many collieries have been working short time for so long, that it would seem that a very large tonnage must be available at present prices with full-time working before there can be any increase.

Best gas makes quote 22s. to 22s. 6d., and Wear Specials 22s. 6d. to 23s. Spot cargoes can often be arranged at lower figures. Then there is still a big drop to seconds and others, which are 18s. 6d. upwards officially; prices for prompt lots being a matter of negotiation.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From our Local Correspondent.

There is a slight improvement in the Yorkshire and the Lancashire coal markets, particularly in domestic coal for home consumption. There are also many inquiries on account of export; in fact, there are more orders than for a considerable time past. There are inquiries from Belgium—which have been absent of late—probably owing to the large numbers of miners on strike there.

South Yorkshire hards are firm at 24s. f.o.b., and it appears likely that prices have touched rock bottom, both for home and export account. Job lots, which have been the principal feature of the coal trade during the past three months, seem to be disappearing entirely, and it seems unlikely that gas managers in future will be able to obtain special lots of screened coal. In the meantime there is an improvement in the industrial sections, but here it is anticipated that the effect of the London conference will be a strengthening of the prices of coal, that orders which have been held back will now be given out, and that there will be a great revival at the beginning of 1925. The coal trade has passed the worst. Screened gas coal to-day is about 21s., and gas nuts 20s. at the pits.

Prices at Hull at the week-end were:—Bunkers: Yorkshire, Derby, and Notts large screened steam, f.o.b. Humber ports, 20s. to 21s. Cargo for export, f.o.b. usual shipping ports: Best South Yorkshire hards, association, 24s. to 24s. 3d.; Derbyshire best hards, 24s. to 25s. 6d.; West Yorkshire Hartleys, 20s. to 22s.; South Yorks washed doubles, 20s. 6d. to 21s.; South Yorks washed singles, 19s.; dry doubles, 17s. to 20s.; South Yorks washed smalls, 16s.; Derbyshire slack, 1 in., 14s.; South Yorks rough slack, 14s. 6d. to 15s.; gas coke, 35s. to 37s.; foundry furnace coke, all f.o.b. Hull, 26s. 3d.; smithy peas, 22s. to 25s.; washed steam thirds, 19s. 9d.; South Yorks washed trebles, 21s. 6d. per ton.

Colliery prices in Lancashire are unaltered at about 34s. for best house coal, 21s. to 22s. for unscreened industrial coal, and 13s. to 17s. for slacks. Furnace coke is a very dull market, with a tendency to sag.

COAL TRADE IN THE MIDLANDS.

From our Local Correspondent.

Pits which produce house coal are working full time for the most part; but gas-works are so well supplied that output has to be curtailed by some of the collieries that cater for their requirements. The stocking of domestic supplies is proceeding steadily. Merchants complain that customers who deferred buying when special concessions off list rates were offered expect to get minimum summer prices now that all such concessions have been withdrawn by the collieries.

The demand for industrial fuel continues very quiet. There is a shrinkage of business in many of the metal-working branches, particularly in the heavy trades. Nevertheless, the evidences of any superabundance of slack are few in the Birmingham area. Much better prices rule than are obtainable in districts which depend primarily upon the export demand. About 11s. is realized for 2-in. slack.

Though furnace coke is plentiful, prices quoted are not materially below the scale agreed between associated interests. There is even a hint of an advance being demanded when contracts come up for review. The indications are, however, that the continued activity of some of the ovens will depend upon when the Continental demand expands. Gas coke is relatively dear. It is not easy to keep pace with requirements.

Kettering Gas Company.—The 66th half-yearly meeting of the Company was held last week, Mr. T. Bird, J.P., presiding. The Chairman mentioned that in the past ten years they had paid £99,004 in wages and £14,845 to the local rates. This showed that the Company were doing something to assist the town. To-day their gas charges were only 40 p.ct. over those of 1914, while the Board of Trade figures showed that the general cost of living had increased by 60 p.ct. The net profit on the half-year amounted to £3339, and dividends were declared of 10 p.ct. per annum on the "A" stock, 7 p.ct. on the "B" stock, and 5 p.ct. on the "C" stock, all less income-tax.

CURRENT SALES OF GAS PRODUCTS.

Tar Products in the Provinces.

Aug. 25.

The market for tar products has remained about the same during the past week. There has been a little more inquiry for pitch, although this has not had any effect on the price. Creosote is quiet.

The average values for gas-works products during last week were: Gas-works coal tar, 39s. to 44s. Pitch, East Coast, 55s. to 57s. 6d. f.o.b. West Coast—Manchester, 50s. to 52s. 6d.; Liverpool, 51s. to 52s. 6d.; Clyde, 52s. to 55s. Benzole 90 p.ct., North, 1s. 5d. to 1s. 6d.; crude 65 p.ct. at 120° C., 1s. to 1s. 1d. naked at makers' works; 50-90 p.ct., naked, North, 1s. 8d. to 1s. 10d. Toluole, naked, North, 1s. 3d. to 1s. 6d., nominal. Coal tar crude naphtha in bulk, North, 7¼d. to 8d. Solvent naphtha, naked, North, 1s. 4d. to 1s. 5d. Heavy naphtha, North, 1s. 2d. to 1s. 3d. Creosote, in bulk, North, liquid, 5¼d. to 5⅜d.; salty, 5d. to 5¼d.; Scotland, 5d. to 5¼d. Heavy oils, in bulk, North, 9d. to 9¼d. Carbolic acid, 60 p.ct, 1s. 10d. to 1s. 11d. prompt. Naphthalene, £15 to £16; salts, £6 to £8, bags included. Anthracene, "A" quality, 4d. per minimum 40 p.ct., purely nominal; "B" unsaleable.

West Riding Gas Inquiry.

A public inquiry was held at Swinton on Friday, by Mr. H. E. Byrne, an Inspector of the Ministry of Health, into an application by the Swinton and Mexborough Gas Board for sanction to borrow £3600 for the installation of a carburetted water-gas plant and a relief holder. Mr. J. W. Brearley (the Manager) said it was a municipal concern, under the control of a Joint Board consisting of representatives of the Mexborough and Swinton Councils. The original cost of the undertaking in 1911 was £71,000, and the total borrowings of the Board amounted to £97,000. It was not until last year that the Board made any appreciable profit. There had recently been a reduction in the price of gas from 6s. to 5s. 9d. per 1000 c.ft. The Inspector said the charge seemed to him to be extraordinarily high. Mr. Brearley replied that standing charges accounted for about 3s. per 1000 c.ft. It was hoped to make the undertaking successful in future by increasing the output. The Accountant to the Board (Mr. G. W. Roberts) said if it were not for the standing charges, the price of gas could be reduced by 3s. 4d. per 1000 c.ft. No opposition was raised to the application.

Chorley Gas Department Report.

The report of Mr. Mark Newsome (Engineer and Manager) on the working of the Borough of Chorley Gas Department for the year ended March 31 states that the total receipts amounted to £50,991, and the expenditure to £37,240, leaving a gross profit of £13,751, and a net profit of £6035, which compares with £7393 a year ago. The average net price of gas actually realized per 1000 c.ft. sold was 3s. 7·59d., as against 4s. 3·21d. in the previous year—representing a reduced income from this source of £3960. It is estimated that a recent reduction of 6d. per 1000 c.ft. will result in a reduced revenue of £5353. The total gas produced during the year was 228,489,000 c.ft., as compared with 219,866,000 c.ft. in the previous year—an increase of 8,623,000 c.ft., equal to 3·92 p.ct. The gas unaccounted-for was 6·28 p.ct. of the make, as against 8·65 p.ct., a decrease of 2·37 p.ct. A hire-purchase scheme for appliances on easy terms has proved highly successful, and improved showroom accommodation which has been secured is expected to assist greatly in the placing of more gas-consuming apparatus. The average yield of gas per ton of coal carbonized was 16,834 c.ft., a small decrease of 216 c.ft., which is accounted for by the heating value of the gas having been increased from an average of 444·1 B.Th.U. to 461·9 B.Th.U. Automatic controllers for lighting and extinguishing the street lamps are proving satisfactory. Residuals yielded a more profitable return, the net result being increased by £1906 as compared with the previous year.

Ambulance Classes at Sheffield.—As a result of the St. Johns Ambulance Classes held at the Sheffield Gas Company's Grimesthorpe Works during last winter, the whole of the thirteen members who sat for the examination have been successful, and have been awarded the Association's Certificates.

Winchester Water and Gas Company.—The ordinary general meeting of the Company will be held to-day, when the Directors will submit their report for the half-year ended June 30. The balance of net revenue available for dividend, after transferring £250 to the reserve fund account, is £4995; and the Directors recommend the payment of a dividend on the preference stock at the rate of 4 p.ct. per annum, less income-tax, and on the consolidated ordinary stock at the rate of 5 p.ct. It is intended to extend the gas supply to the village of Littleton, which is outside the statutory area of the Company. In order to facilitate the raising of further capital, an application is being made to the Board of Trade under the Public Utilities Companies (Capital Issues) Act, 1920. An extraordinary general meeting will be held on the termination of the half-yearly meeting, to pass the necessary resolutions.

Reconstruction at Burnley.—The Burnley Corporation have erected a new gasholder, but have not yet finally settled matters in connection with the proposed new works. Mr. J. P. Leather, the former Gas Engineer, prepared a scheme at the request of the Committee; and with but slight alterations this was approved by Mr. Doig Gibb. Then it was decided to appoint a Sub-Committee to inspect plant at other works in the country, with a view to confirming the two reports. This Committee visited Liverpool, Lytham St. Annes, Bath, and Birmingham, and consider that for the first installation the retorts should be of the horizontal type; but it may be that at a later date, and before a further unit is necessary, the conditions will be such as to justify some amendment. Their report has been approved by the Gas Committee and the General Purposes Committee, and only needs confirmation by the Town Council to enable work to begin.

STOCK MARKET REPORT.

A FAIRLY confident tone was maintained on the Stock Exchange during the past week. The satisfactory termination of the London Conference, however, brought about no great increase in business; and it is not to be expected, in view of the extraordinary scenes in the Reichstag on Friday and the reported Cabinet differences of opinion on the report, that there will be any immediate improvement.

British Government stocks continued in demand, Conversion Loan rising ⅝ on the week. Colonial stocks, especially new issues, showed a tendency to harden. The attractive returns on some of the Home Rails to which we have previously referred, led to a fair amount of investment, Districts being marked up 1½. Iron, Coal, and Steel were depressed. Oils on further cuts in the price of crude, and the foreshadowing of a reduction in the price of petrol, had a tendency to droop, though there was no real public selling.

In the Gas Market there was a fair amount of business. The Brentford stocks continued to advance during the week, and on Saturday both the "A" and the "B" stocks stood at 108 113. As far as can be ascertained, no official announcement has yet been made of the terms of the proposed amalgamation with the Gas Light and Coke Company, but the rise in the quotation indicates that the Brentford stockholders will have no cause of complaint with regard thereto. It will be seen that the quotation of Wandsworth "B" stock showed an improvement of 3 points.

The following transactions were recorded during the week: On Monday, Bournemouth "B" 12 7/16 *ex* div., Brentford "B" 108, Brighton and Hove original 174, "A" 128½, British 117½, 118½, European 7⅞, 7⅞, Gas Light and Coke 90¾, 90⅞, 91¼, 91⅜ *ex* div., 3½ p.c. maximum 62⅝ *ex* div., 4 p.c. preference 78½, 79½ *ex* div., 3 p.c. debenture 60, 60½, Primitiva 6s. 7½d., 6s. 9d., 4 p.c. (River Plate) debenture 55, South Metropolitan 98 *ex* div., Southampton 5 p.c. maximum 86, Tottenham 4 p.c. debenture 77. Supplementary prices, Danish 63s. 1½d.

On Tuesday, Alliance and Dublin 63½, Bournemouth "B" 12 7/16 *ex* div., Brentford "B" 107, 110, Commercial 4 p.c. pref. 90, European 8, Gas Light and Coke 90¼, 90⅝, 91, 91⅛, 91¼, 91⅜ *ex* div., 3½ p.c. maximum 62⅝, 63 *ex* div., 3 p.c. debenture 60½, Imperial Continental 165, Primitiva 7s., South Metropolitan 98⅛, 98¼ *ex* div. Supplementary prices, Brentford 6 p.c. mortgages 99, 99¼.

On Wednesday, Aldershot 4 p.c. prefereace 71 *ex* div., Brentford "B" 108½, Continental Union 29, European £8 1s., 8 1/16, Gas Light and Coke, 90⅝, 90⅞, 91, 91¼, 91⅜, *ex* div., 4 p.c. preference 78½, 79¼ *ex* div., 3 p.c. debenture 60¼, 60½, 61, Imperial Continental, 165, 167, Montevideo 56, South Metropolitan, 98½ *ex* div., 3 p.c. debenture 61, Tottenham "B" 100. Supplementary prices, Reading 5 p.c. maximum 81½, 82.

On Thursday, Brentford "A" 108, "B" 109, 110, 110 1/16, 112, 5 p.c. preference 92, Commercial 4 p.c. 91, European 8, 8½, Gas Light and Coke 90⅝, 90⅞, 91, 91⅛, 91¼ *ex* div., Imperial Continental 165½, Primitiva, 6s. 9d., 7s. 3d., South Metropolitan 98⅜ *ex* div., South Suburban 103½ *ex* div. Supplementary prices, Croydon 6 p.ct. debenture 100, 102, Pinner 6 p.ct. preference 1/16.

On Friday, Aldershot 4 p.ct. preference 72 *ex* div., Alliance and Dublin 63¾, Bournemouth "B" 7 p.ct. max. 12 7/16, 12 7/16 *ex* div., 6 p.ct. preference 11¼ *ex* div., Commercial 3½ p.ct., 90, Continental Union 29, 29⅛, European 8, Gas Light and Coke 90⅝, 91, 91 7/16, 91¼ *ex* div., 4 p.ct. preference 78½, 78¼ *ex* div., 3 p.ct. debenture 60⅛, 60½, 61, Imperial Continental 167, Primitiva, 6s. 9d., 4 p.ct 1st debenture 76¾, 77½, South Metropolitan 98¼ *ex* div., 3 p.ct. debenture 60½, 61, South Suburban 5 p.ct. 102, 102½ *ex* div., Tottenham District "B" 3½ p.ct. 100½-101½, Wandsworth "B" 3½ p.ct. 114, 115.

Stringent conditions prevailed in the Money Market, but as usual there was an easier tendency at the close of the week. Overnight accommodation was obtainable at 3 p.ct., which rate, however, gradually weakened to 2½ p.ct. There was a drop of 1s. 6d. in the average rate per cent. (£3 13s. 9·16d.) at which Treasury Bills were allotted.

The Foreign Exchange Market was fairly active, but conditions were unsettled. Sterling on New York, which a week ago stood at $4 52⅜, dropped to $4 50 7/16. French francs closed at 83 32½, compared with 81 35; Belgian francs 90½, compared with 89½; and Italian lire at 101⅛, compared with 100⅜.

Silver was quiet, and in the absence of support the price declined to 34⅛d. per oz.

The Bank Rate is 4 p.ct., to which it was raised from 3 p.ct. on July 5, 1923. Bankers' deposit rates are 2 p.ct. The deposit rates of the discount houses are 2 p.ct. at call and 2½ p.ct. at notice.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Aug 23.	Rise + or Fall − on Week.	Transaction Lowest and Highest Prices.
£			%p.a.	%p.a.				
131,978	Stk.	Aug. 14	5	5	Aldershot 5 p.c. max. C.	80—83*	..	..
235,492	,,	,,	4	4	Do. 4 p.c. Pref.	68—72*	..	71—72
1,351,868	,,	Apr. 3	5½	6	Alliance & Dublin Ord.	63—68	..	63¼—63½
374,000	,,	July 10	4	4	Do. 4 p.c. Deb.	60—65	..	..
280,000	5	May 22	8	8	Bombay, Ltd.	5—5½	..	..
100,000	10	Aug. 14	8½	8½	Bournemouth 5 p.c.	12—13*	..	..
383,110	10	,,	7	7	Do. B 7 p.c..	11½—12½*	..	12 7/16—12 9/16
150,000	10	,,	6	6	Do. Pref. 6 p.c..	10½—11½*	..	11½
30,000	Stk.	June 26	3	3	Do. 3 p.c. Deb..	54—59	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb..	74—79	..	..
992,045	,,	July 10	6 1/10	6 1/10	Brentford A Con.	108—113	+3½	108
990,500	,,	,,	6⅝	6⅝	Do. B New	108—113	+3½	107—112
76,000	,,	,,	5	5	Do. 5 p.c. Pref.	87—92	..	92
306,690	,,	June 12	4	4	Do. 4 p.c. Deb.	75—80	..	..
181,337	,,	—	6	6	Do. 6 p.c. Rich. Red. Deb.	100—105	..	..
214,740	,,	Mar. 6	11½	11½	Brighton & Hove Orig.	171—176	..	174
244,200	,,	,,	8	8½	Do. A Ord.	126—129	..	128½
1,287,500	,,	July 24	5	5	Bristol 5 p.c. max..	91—92*a	..	..
855,000	,,	Mar. 20	—	7	British Ord.	117—122	..	117½—118½
100,000	,,	June 26	7	7	Do. 7 p.c. Pref..	116—123	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	72—77	..	..
100,000	10	May 22	6	8	Cape Town, Ltd.	6½—7½	..	..
100,000	10	Apr. 24	4½	4½	Do. 4½ p.c. Pref..	6—7	..	..
150,000	Stk.	June 26	4½	4½	Do. 4½ p.c. Deb..	71—76	..	..
626,860	,,	July 24	6	6	Cardiff Con. Ord.	97—100	..	..
237,860	,,	June 26	7½	7½	Do. 7½ p.c. Red. Deb..	103—106	..	..
137,150	,,	Aug. 14	6½	5	Chester 5 p.c. Ord.	86—91*b	..	..
1,513,280	,,	July 24	6	6	Commercial 4 p.c. Cap.	88—93	..	90—91
560,000	,,	,,	6	6	Do. 3½ p.c. Cap.	88—93	..	90
475,000	,,	June 12	3	3	Do. 3 p.c. Deb.	56—59	..	..
800,000	,,	14 Jan. 15	—	—	Continental Union, Ltd.	27—32	..	29—29½
200,000	,,	June 12	7	7	Do. max. div.	85—89	..	..
660,000	,,	Mar. 6	6½	6½	Croydon sliding scale	101—104	..	..
284,975	,,	,,	5	5	Derby Con.	108—110c	..	..
492,270	,,	Feb. 21	3	4½	Do. Deb.	74—76c	..	..
55,000	,,	July 10	4	4	East Hull 5 p.c. max.	..	..	..
209,000	,,	Apr. 3	5	5	European, Ltd.	7½—8½	..	7⅞—8 1/16
1,002,180	10	July 24	2	6	Gas Light & Coke 4 p.c. Ord.	90—92*	..	90½—91½
16,503,045	Stk.	Aug. 14	5⅜	5⅜	Do. 3½ p.c. max.	61—64	+1	62½—63
2,600,000	,,	,,	3½	3½	Do. 4 p.c. Con. Pref.	78—81*	..	78½—79½
4,062,235	,,	,,	4	4	Do. 3 p.c. Con. Deb.	60—63a	..	60—61
4,761,930	,,	June 12	3	3	Do. 10 p.c. Bonds	..	..	..
130,000	,,	—	10	10	Do. 7½ p.c. Ilford Deb.	..	..	..
42,000	,,	—	7½	7½	Hastings & St. L. 5 p.c. Conv.	91—96	..	..
82,500	,,	Mar. 20	6½	6½	Do. 3½ p.c. Conv.	76—81	..	..
258,740	,,	,,	5½	5½	Hongkong & China, Ltd.	16—17	..	..
70,000	10	May 8	10	10	Hornsey 7 p.c.	138—143*	..	..
86,600	Stk.	Aug. 14	9½	10	Imperial Continental Cap.	165—170	..	165—167
1,976,000	,,	May 22	10	30	Do. 3½ p.c. Red. Deb.	68—71*	..	..
263,950	,,	Aug. 14	3½	3½	Lea Bridge 5 p.c. Ord..	95—100*	..	..
235,242	,,	Aug. 14	6½	6½	Liverpool 5 p.c. Ord.	89—90*b	..	..
2,127,340	,,	Aug. 14	5½	5½	Do. 7 p.c. Red. Pref.	103—106b	..	..
600,000	,,	Mar. 20	7	7	Maidstone 5 p.c. Cap.	124—129	..	..
165,736	,,	Feb. 21	8	9	Do. 3 p.c. Deb..	53—58	..	..
63,480	,,	June 26	3	3	Malta & Mediterranean	3½—3¾	..	..
75,000	5	,,	5	7	Montevideo, Ltd.	54—59	..	56
541,920	Stk.	June 12	4	4	Newcastle & Gateshead Con.	82½—83½*d	..	..
1,875,892	,,	July 24	5½	5	Do. 4 p.c. Pref..	74—75*d	..	..
250,166	,,	,,	4	4	Do. 3½ p.c. Deb.	70—72d	..	..
529,705	,,	June 26	3½	3½	North Middlesex 10 p.c.	16—17	..	..
13,000	10	Mar. 6	11	11	Do. C	11½—12	..	..
75,940	10	,,	7 7/10	7 7/10	Oriental, Ltd.	98—101	..	..
300,000	Stk.	May 8	9	7	Plym'th & Ston'house 5 p.c.	112—117	..	..
138,120	,,	June 26	7⅞	7⅞	Portsea Island B	102—105	..	..
60,000	50	Mar. 6	13	13	Do. C	98—103	..	..
100,000	50	,,	12	12	Primitiva Ord.	⅛—¼	..	6/7½—7/3
2,289,909	1	—	—	—	Do. 4 p.c. Red. Deb..	75—78	..	76½—77½
341,400	100	June 2	4	4	Do. 4 p.c. Red. Deb. 1911	53—56	..	..
600,000	Stk.	July 24	4	4	Do. B. Aires 4 p.c. Rd. Db.	54—57	..	55
220,335	,,	June 26	4	4	Do. R'r P'te 4 p.c. Rd. Db.	54—57	..	..
321,670	,,	,,	4	4	San Paulo 6 p.c. Pref.	7—7½	..	..
450,000	10	Mar. 20	6	6	Do. 5 p.c. Red. Deb.	41—43	..	..
125,000	50	July 1	5	5	Sheffield A	99—101e	..	..
270,000	Stk.	Mar. 20	5	5/8/4	Do. B	99—101e	..	..
419,968	,,	,,	5	5/8/4	Do. C	99—101e	..	..
1,047,000	,,	,,	5	5/8/4	South African	7—9	..	..
90,000	10	June 12	6	8	South Met. Ord.	97—99*	..	98—98½
6,609,895	Stk.	Aug. 14	6½	5	Do. Red Pref.	96—98	..	..
102,580	,,	July 10	5	5	Do. 3 p.c. Deb.	58—61	..	60½—61
1,895,445	,,	,,	3	3	Do. 6½ p.c. Red. Deb.	103—105	..	..
734,000	,,	Mar. 6	6½	6½	South Shields Con.	136—138d	..	..
91,500	,,	,,	8½	8½	South Suburban Ord. 5 p.c.	102—107*	..	102—103½
1,087,795	,,	Aug. 14	6½	6½	Do. 5 p.c. Deb.	93—98	..	..
368,837	,,	June 26	5	5	South'mpt'n Ord. 5 p.c. max.	85—88	..	86
647,740	,,	May 8	6	5	Do. 4 p.c. Deb.	73—78	..	..
121,275	,,	June 26	4	4	Swansea 7 p.c. Red. Pref.	104—106	..	..
250,000	,,	Mar. 6	7	7	Do. 6½ p.c. Red. Deb.	102—104	..	..
200,000	,,	June 26	6½	6½	Tottenham District A 5 p.c.	116—119	..	..
120,000	,,	July 24	8	8	Do. B 3½ p.c.	99—102	..	100—101½
582,275	,,	,,	6½	6½	Do. 4 p.c. Deb.	76—80	..	77
181,255	,,	June 12	4	4	Tynemouth Con. and New	86—88	+½	..
258,251	,,	Mar. 20	5	7/14/4	Wandsworth, Wimbledon, and Epsom—			
30,000	,,	July 10	9½	9½	Wandsworth A 5 p.c.	132—137	..	..
255,636	,,	,,	7½	7½	Do. B 3½ p.c.	113—118	+3	114—115
108,075	,,	,,	6/7/9	6/9/6	Do. C	96—101	..	..
240,865	,,	,,	6/7/9	6/9/6	New Ordinary	..	..	..
353,000	,,	,,	7½	7½	Wimbledon 5 p.ct.	110—115	..	..
98,000	,,	,,	7½	7½	Epsom 5 p.ct..	115—120	..	..
88,416	,,	June 26	3	3	3 p.c. Deb.	55—60	..	..

Quotations at:—*a*.—Bristol. *b*.—Liverpool. *c*.—Nottingham. *d*.—Newcastle. *e*.—Sheffield. * Ex. div.

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Salisbury Gas Company.

Alderman Chas. Haskins presided at the annual general meeting of the Company last Wednesday, and in moving the adoption of the report and payment of the full statutory dividends, said that the gas sales showed an increase of 4·6 p.ct. The number of consumers had increased, and the price of gas had been reduced each half-year since July 1, 1922; and they hoped for a further reduction at Christmas. The works and plant were being kept well up to the mark. New governors and mains had been installed, which would remedy a serious defect on the holder outlet, especially at cooking hours; and several weak spots in the distribution department had been remedied. Residuals had done well. They were greatly indebted to the able supervision of their Engineer and Manager (Mr. W. Fielden), whose services to the Company could not be too highly valued. He had the greatest pleasure in proposing that the number of Directors be increased to six, and he hoped the shareholders would elect Mr. Fielden to be the new Director. This was carried unanimously, and the Board afterwards, at an adjourned meeting, appointed Mr. Fielden Managing Director to the Company.

Colchester Gas Company.

The half-yearly meeting of the Company was presided over by Mr. W. Gurney Benham (the Chairman), who, in moving the adoption of the report and accounts, said the period under review had been a prosperous one. The consumption of gas showed an increase of 7·4 p.ct.; and owing to this increased demand, there had been a difficulty in providing an adequate supply in the north district of the town at times of heaviest cooking load. To increase this supply, a new 10-in. main had been provided. This had added to the labour bill £400, the whole of which amount was included in the half-year's expenditure. Heavy sums for repairs of services, meters, and stoves had also been charged, and the whole undertaking was being maintained at the highest standard. In other words, profits were not being made by allowing the Company's property to depreciate. The output and sale of residuals during the half-year had been very satisfactory. They had yielded 71 p.ct. of the cost of the coal and oil—a remarkably fine achievement. Repairs and maintenance of works had cost nearly £6000. The new retort house, erected in 1919, was being further extended. This was contemplated when the house was erected, and was simply a matter of lengthening the building and adding more retorts. It would not involve any addition to coal or coke handling machinery. After meeting all charges, including the exceptional items mentioned, the balance of profit on the half-year was enough to provide for interest on mortgages and for the usual dividends—a good result, bearing in mind that as from Jan. 1 the price of gas was reduced to 10d. per therm, or 3s. 11d. per 1000 c.ft. The shareholders might feel every confidence in the Manager (Mr. W. W. Townsend) and the Secretary (Mr. W. English) and staff generally. Dividends at the rates of £6 7s. 6d. p.ct. for the half-year on the "A" shares, £4 9s. 3d. p.ct. on the "B" shares, and 6 p.ct. on the preference stock were unanimously agreed to.

Bridport Gas Company.—The report of the Directors for the year ended June 30 states that there is a further increase of 4¼ million c.ft. in sales of gas—an increase of over 11 p.ct. £500 has been placed to reserve, and dividends at the rate of 5 p.ct. on the "A" preference, 6½ p.ct. on the "B" cumulative preference, and 10 p.ct. on the ordinary shares are recommended, less income-tax. A balance of £280 will be carried forward.

Rossendale Union Gas Company.—The report of the Company for the last half-year discloses a profit of £5245, and dividends are recommended at the following rates: On the original, new ordinary, and preferred ordinary shares, 10 p.ct.; on the Amendment Act and New Amendment Act shares, 7 p.ct.; on the 1876 Act shares, 7½ p.ct.; and on the new preference shares, 5 p.ct. The accounts show an increase in the sale of gas of 3·16 p.ct., as compared with the quantity sold in the corresponding period of last year.

Bridgnorth Gas Affairs.—It was reported to the Bridgnorth Town Council last week that the make of gas last quarter had exceeded that of the corresponding quarter of 1923 by 252,000 c.ft. Mr. Edge, in moving the adoption of the report, said that he thought it would be generally agreed that the position of the Department was steadily improving, and, judging by the increased consumption of gas, it would appear that its use for cooking and heating purposes was becoming more popular. A considerable number of new applications for the instalment of prepayment meters had recently been received; and as the cost of the meters was rather heavy, the Committee had had to ask each applicant to give a guarantee to use a minimum amount of gas each quarter, to safeguard the Department from financial loss.

South Shields Gas Company's Dividend.—The dividend declared for the half-year ended June 30 on the Consolidated stock of the South Shields Gas Company is at the rate of 4½ p.ct.—not 4¼ p.ct., as stated on p. 657 of last week's "JOURNAL."

Gas-Stove Explosion.—Four employees and a son of the proprietor were severely burned through an explosion connected with a gas-stove in the blacking and drying shed of a Tipton iron foundry. They were inside the shed, which caught fire. The cause of the explosion is unknown.

Barnsley Gas Company.—The Directors, in their report for the year ended June, state that, in addition to the interim distribution already made, they recommend dividends of 5 p.ct. on the general capital and "F" shares, 3 p.ct. on the "C" preference shares, and 3½ p.ct. on the "D," "E," and "G" shares—all less tax.

Colwyn Bay Gas Profits.—The statement of accounts for the past year in connection with the gas undertaking of the Colwyn Bay Urban District Council was presented last week, when the Lighting Committee recommended a reduction of 5d. per 1000 c.ft. in the price of gas for ordinary, power, and prepayment supplies, to date from the quarterly readings of meters at Christmas next. The net profits of the Department amount to £3891, and after charging £1607, in respect of meters, cookers, and new services, there is a surplus on the year of £2283. The balance in hand on revenue account is now £6340.

Coatbridge Gas Company.—The annual general meeting of the Company was held last week at the offices, Mr. Robert Watterston, J.P. (the Vice-Chairman) presiding. In submitting the report, he said that the sales of gas for the past year showed an increase of 9·8 p.ct., while the unaccounted-for gas had been reduced. Extensions to various outlying districts had now been completed, and they anticipated a further considerable increase in the sales. He moved the adoption of the report and the accounts, and the payment of dividends at the rate of £14 5s. p.ct. per annum on the original stock, and £9 19s. 6d. p.ct. per annum on the four issues of new shares, all less income-tax. The motion was seconded by Mr. John W. Miller, J.P., and unanimously agreed to.

The Brampton Gas Light and Coke Company have made a reduction in the price of gas from 5s. 11d. to 5s. per 1000 c.ft.

The Thornton Urban District Council are applying to the Ministry of Health for sanction to borrow £6000 for the purpose of extensions to the gas-works.

At present Blackpool has 3½ miles of gas-pipes on order, and the Gas Engineer has purchased second-hand pipes from Gretna (now being dismantled) to meet the demand.

After the readings of the meters for the September quarter, the Kidderminster Gas Company will make a further reduction of 6d. per 1000 c.ft. (1⅛d. per therm) in the price of gas.

The Leeds chemical works of Messrs. Brotherton & Co., Ltd., were the scene of a serious accident last Friday week, when an iron still, 9 ft. in diameter, exploded, and shattered the roof of a carbolic acid plant. Fire broke out immediately after the explosion, but was quickly extinguished. Fortunately no one was injured.

It is understood that the Oldbury Tradesmen's Association intend to bring pressure to bear upon the Urban District Council to provide more adequate and efficient lighting in the town. The Association urge that more light is badly wanted, and that the only way in which any good can be done for Oldbury is to make it brighter.

The erection of a new gasholder at Poulton-le-Fylde has been commenced. By this means the storage capacity at the works will be increased by 70,000 c.ft. immediately, and by 140,000 c.ft. eventually—sufficient to meet the needs of the district. It is anticipated that the new holder will be completed by the end of October. Extensions in the retort house have also been started.

The Carlington (Cornwall) Electric Lighting Company being unable to guarantee the electric lighting of the streets of the town by Oct. 1, in consequence of the Electric Lighting Order, which was applied for last May, not having been confirmed by both Houses of Parliament, the Urban Council have decided to accept the tender of Messrs. While and Son to light the streets with gas.

Darwen Corporation are encouraging the greater use of gas by offering facilities for the purchase of gas grates, radiators, cookers, and wash boilers. There are already 3239 cookers, 2839 wash boilers, 1043 fires, 133 radiators, and 38 other gas appliances in use; and considerable additions to these numbers are expected as the result of a special exhibition being held in the town. For the size of the Borough, Darwen's figures are very encouraging.

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(See Article in "JOURNAL," May 21, p. 523.)

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